EDTECH IN INDONESIA –
READY FOR TAKE-OFF?

May 2020

WORLD BANK GROUP

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Executive Summary

While Indonesia has made significant progress on increasing access to education over the past few decades, learning outcomes remain low. In addition to key reforms in the public education system in terms of increased quality of spending, the use of information, communications and technology for education (EdTech) provision holds considerable promise in improving educational outcomes. This is particularly the case in Indonesia, where the newly appointed Minister of Education has indicated strong interest in leveraging technology for learning.[1] Globally, this trend is driven largely by the private sector, which has higher incentives to innovate than the public sector. For instance, in India, MindSpark products individually customize educational content to match the level and rate of progress of each student; in the United States, Coursera provides an online platform for acquiring bachelor's or master's degrees; in China, VIPKid connects learners with English-speaking tutors from the United States and Canada. The COVID-19 crisis has forced a very fast and broad increase in the use of EdTech, which is expected to have lasting effects on the market.

This EdTech landscape survey provides an overview of the Indonesian startup ecosystem in EdTech, drawing upon three main sources of information: publicly available data, information collected via an online-questionnaire sent to 60 EdTech players—representing the vast majority of the main players—and 18 structured, in-depth face-to-face interviews from December 2018 through February 2019, as well as a group consultation with preliminary findings and recommendations. The findings reveal that the Indonesian EdTech sector is starting to catch up with the global frontier, and with growth of similar platforms, such as Harukaedu (a platform offering online university degrees), Ruangguru (an interactive e-learning platform for K-12 students in Indonesia) and Cakap by Squline (a tutoring platform for language learning), but overall the sector is still in its infancy. This early stage of development applies to evidence as well; there is almost no rigorous information available about the quality or effectiveness of the products and services offered in the Indonesian EdTech market, something that is true of many EdTech markets globally.

Indonesian EdTech products generally aim at helping students with learning and upskilling, helping educators with student management, communication and teaching, and helping educational institutions with administration. For example, companies such as Ruangguru, Zenius and Quipper provide self-directed e-learning content, interactive learning platforms, and study tools that help students to expedite the learning process, along with interactive online services that help students with their assignments and test preparation. Companies such as Arsa Kids, Digikids and Educa Studio develop game-based and blended learning experiences, including interactive storybooks and educational mobile apps, to help improve early childhood educators' effectiveness.

The sector is still in its infancy, with almost all the main EdTech startups engaged in a high level of product/market experimentation. Ninety percent of EdTech firms surveyed have changed their original business models after identifying new gaps in the sector and/or to achieve greater cost-efficiency. In addition, most Indonesian EdTech firms initially offer some features or content for free, or provide full-feature/content

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1   https://tekno.tempo.co/read/1269241/klarifikasi-nadiem-makarim-soal-penggunaan-aplikasi-pendidikan

for free for a limited time before they start charging fees. However, most free users do not upgrade to paid accounts after the trial period ends, and this helps to explain why most firms are not yet profit-generating.

Most EdTech firms directly target students, while less than one-third of the survey respondents target parents and only a handful target teachers. This is at odds with the fact that parents and teachers play a significant role in dissemination of EdTech products, and may add to the firms' challenge of becoming profitable. Products and services offered in the Indonesian EdTech sector typically target junior high schools, senior high schools and higher education, as well as professionals, with few products in the primary or pre-primary sectors or in technical/vocational education. This focus on later school years is a missed opportunity, in part because returns to learning decrease with age (Heckman, 2006). More importantly, it is part of the inequality of the current EdTech ecosystem, which is pitched toward older, wealthier, more urban clients over younger, poorer, more rural ones. Some of this is predictable, as markets follow clients and required minimum levels of connectivity and data speeds, but there are large opportunities to improve equality.

Another challenge for Indonesia's EdTech sector, likely connected to the current low profitability of the sector, is funding. The majority of the firms surveyed have acquired funding from more than one source, with the most common source being angel investors. Interviews with venture capital firms (VCs) and other capital investors suggest that the EdTech sector has not yet gathered significant attention from VCs. This is at least partly because Indonesian EdTech firms are perceived as low-yielding social enterprises compared with other high profit-generating technology startups.

Despite this, the general perception among investors we interviewed is that the EdTech sector in Indonesia has great market potential—assuming that the current major bottlenecks can be addressed—as it still lags far behind other emerging countries, such as China and India. For example, in 2017, around half of all EdTech companies in the world that raised more than US$100 million in capital were in China (Adkins, 2018). By some estimates, China's EdTech sector is projected to grow by 20 percent annually over the next few years (Liu, 2018). The Indian online education sector is expected to grow around eightfold between 2016 and 2021 (KPMG, 2017).

The Indonesian EdTech sector faces major bottlenecks that prevent it from replicating a similar level of success seen in other technology sectors and in other countries. These bottlenecks can be broadly categorized in two groups. Supply-side constraints include: (i) difficult access to funding; (ii) high marginal costs particularly to acquire and retain new customers; and (iii) a shortage of qualified talent to develop and maintain products. These are coupled by demand-side constraints including: (iv) a low willingness to pay on the side of customers, schools and parents in particular; (v) a lack of digital literacy particularly on the side of education providers; and (vi) poor digital infrastructure, which limits connectivity in remote regions and download speeds across the country. The overlapping responsibilities between local and central governments on new education tools, along with the public education system's limited capacity and limited incentives to value the potential of EdTech products, further complicate these constraints. In addition, Indonesia's underdeveloped consumer protection regulations, particularly on data security and privacy, mean that student and school data may be at risk.

A number of options could help to address these constraints.

1. The Government of Indonesia (GoI) should set standards for data privacy and security related to EdTech products. This has been a major issue in other markets, particularly the United States, and has contributed to a backlash against EdTech in some school districts internationally.

2. EdTech firms could partner with academia and government to establish clear standards for performance and cost-effectiveness, and to transparently and rigorously evaluate some of the current leading products.

3. The GoI should continue to invest in improving digital infrastructure and connectivity, particularly in underdeveloped areas and for underserved communities. The inequalities in access to online learning mean that children without connectivity have fewer opportunities to learn while schools are closed as part of the COVID-19 crisis response.

4. One key step will be to help increase potential customers' trust toward these new learning and teaching tools and, as a result, also their willingness to pay. This will require increased support for the development of EdTech startups, making use of startup assistance organizations (SAOs).

5. Both the public and private sectors need to engage with each other more effectively. Private firms need to better understand the needs of teachers, schools and parents, while the public sector needs to become more effective at engaging with the private sector, clarifying its governance structure and promoting public-private partnerships (PPPs) for product development.

6. The public education system could partner with EdTech firms to improve teachers' ability to deliver technology-focused content. An effective partnership with EdTech firms could also help public education to update the content of the national curriculum, not just in terms of, but also beyond, technology-related topics. This partnership could also support student learning in the event of another crisis that restricts student access to schools, increasing the overall resilience of the education system.

01

THE INDONESIAN ICT4E LANDSCAPE

INTRODUCTION

Indonesia has made significant improvements in its education sector over the past 15 years through major reforms. In particular, gains have been made in terms of improving access to education, as well as educational attainment (World Bank, 2018a). Despite these gains, however, Indonesia still lags behind many regional peers in terms of student learning— based on PISA 2018 scores, only 30 percent of students met the most basic level of literacy proficiency (OECD, 2018). Indonesia lags behind many emerging market peers in terms of spending and learning outcomes as measured by global benchmarks such as PISA scores (Figure 1). Such low levels of sector productivity are concerning, especially when the Government of Indonesia (GoI) has a legal mandate to spend 20 percent of its budget on the education sector. While the Indonesian mandate may appear to be a very large amount, when expressed in terms of share of GDP, Indonesia lags behinds its regional peers in public education spending (Figure 2). This an effect primarily of low levels of tax collection, which is expected to worsen during the COVID crisis.

Figure 1: Room for improvement in government spending and learning outcomes
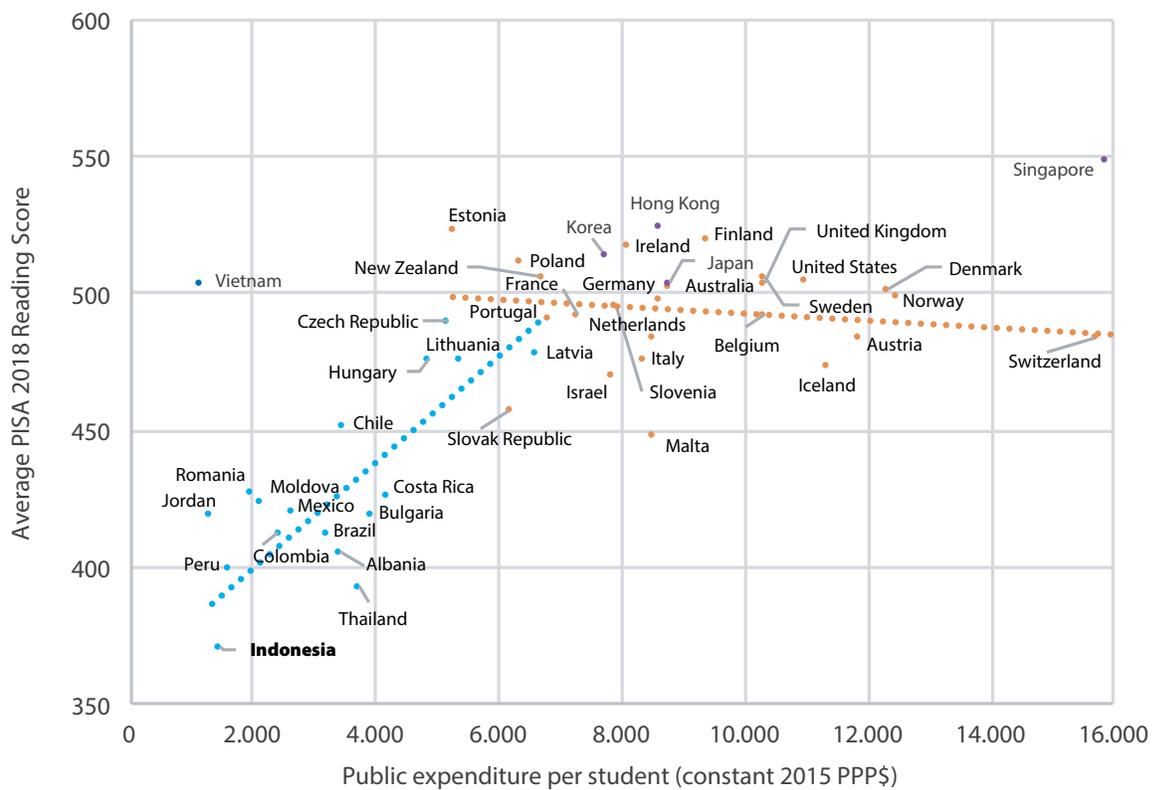
Source: Calculated from PISA and UNESCO UIS (2020).

Figure 2: **Indonesia's relatively low expenditure on education**

Country	Government Spending on Education as a % of GDP				GDP Per capita (US$)
	2000	**2005**	**2010**	**2013**	**2018**
Singapore	3.3	3.2	3.1	2.9	64,582
Japan	3.5	3.4	3.6	3.7	39,290
Rep. of Korea	4.3	3.9	4.9	4.6	31,363
China		2.8	3.6	3.9	9,771
Vietnam			5.1	5.7	2,567
Thailand	5.3	3.9	3.5	4.1	7,274
Malaysia	6.0		5.0	5.5	11,373
Indonesia		2.9	2.8	3.4	3,894
Philippines	3.3	2.4	2.2	2.6	2,730
Mongolia	5.6		4.6	4.9	4,122
PNG	3.3	2.4		4.8	3,103
Lao PDR	1.5	2.4	1.7	3.2	2,542
Timor-Leste			2.4	1.4	2,036
Myanmar			0.7	2.0	1,326
Cambodia	1.7		1.5	2.1	1,510

Source: World Bank (2018a).

This learning gap is particularly salient in light of the increased automation and sophistication of production technology, which has raised the importance of skills quality for firms, particularly high-skilled labor. The labor force's quality of skills, particularly that of high-skilled professionals and managers, is a key concern. The share of firms in Indonesia that report adequacy of skills as the top constraint when hiring managers and professionals is the highest in the region (Figure 3; Gomez-Mera and Hollweg [2018] based on WBES data). On the other hand, firms searching for unskilled production workers appear to complain less than their regional comparators about the inadequacy of available skills. This is consistent with a recent joint GoI–World Bank (2018a) assessment, which highlights critical shortages of skills in dozens of managerial and professional positions (GoI and World Bank, 2018a). These skills constraints matter for productivity. Firms reporting difficulties in hiring managers and high-level employees experience 50 percent lower employment growth, while difficulties in finding employees with foreign languages, or technical, leadership and management skills are correlated with weaker firm performance and lower productivity among Indonesian firms (Gomez Mera and Hollweg, 2018). And poor management quality is typically associated with low innovation (Cirera and Maloney, 2017), which may help explain the low share of firms generating product or process innovation in Indonesia. Despite these skills shortages, the share of Indonesian firms that employ on-the-job training is one of the lowest among middle-income countries (Gomez Mera and Hollweg, 2018).

Figure 3: Lack of the right skills bites, particularly for managers

Share of firms that cited inadequate skills as the key barrier in trying to hire each type of worker, percentage
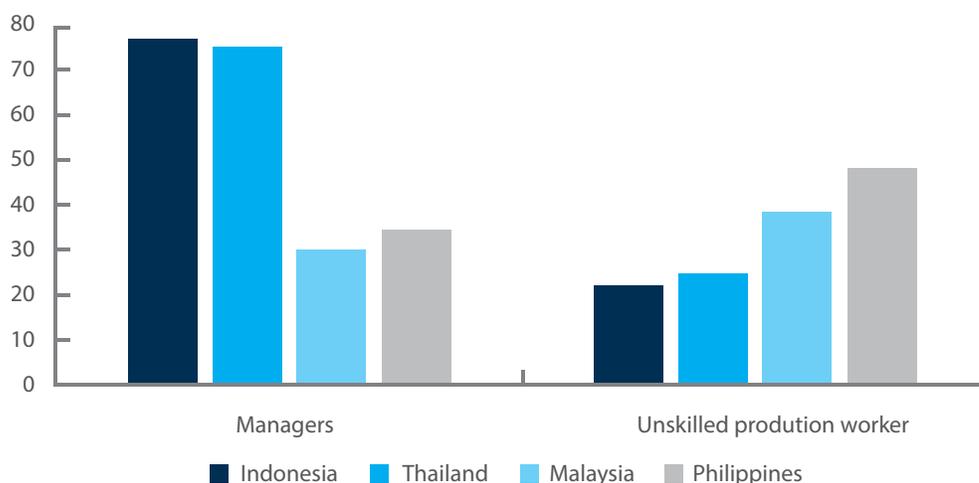
Source: Gomez-Mera and Hollweg (2018) based on WBES data.

The *World Development Report 2016* noted that, while digital technologies have spread rapidly, digital dividends—the broader development benefits from using these technologies—have lagged behind and are unevenly distributed (World Bank, 2016). This is especially true in education—and particularly in Indonesia. While technology in general, and EdTech in particular, can be a part of addressing the major inequalities in learning outcomes for Indonesian students, it is unlikely to be able to fill the gap on its own. Access to technology does not guarantee its use, which in turn does not guarantee learning, unless the technology is effective in increasing student learning outcomes.

The use of information, communications and technology (ICT) for education (EdTech) provision holds considerable promise in improving educational outcomes and is driven largely by the private sector. The rapid digitization of key services is expanding the opportunities to use ICT to aid the learning of students; for example, Coursera (United States) provides an online platform for acquiring bachelor's or master's degrees online; Byju's (India) provides an e-learning platform for primary to high school students and coaching classes for competitive examinations through a mobile application; and VIPKid (China) connects learners with English-speaking tutors from the United States and Canada. Alongside the success of such platforms globally, Indonesia's startup ecosystem has witnessed growth of similar platforms, such as Harukaedu (a platform offering online university degrees), Ruangguru (an interactive e-learning platform for K-12 students in Indonesia) and Cakap by Squline (a tutoring platform language learning). Indeed, an examination of the nexus between education and technology is critical, especially as evidence suggests that digitization is closely correlated with increased labor productivity (Figure 4). The private sector is uniquely placed in mainstreaming the use of ICT products and services in the education sector due to two factors. First, its incentives to introduce new solutions to existing problems are typically greater than those in the public sector if such solutions hold commercial potential. Second, such ICT products are often commercially viable, as much of the returns to their use are private (the individual benefiting from improved learning

outcomes). In certain instances, the public sector may also be willing to pay for such products to the extent that the improvement in learning outcomes can be demonstrated and applies across a broad range of students.

This paper maps out the Indonesian ICT for education (ICT4E) landscape, focusing on commercial EdTech startups. It provides an overview of some of the main players, the main products/services, and some of the main challenges faced by EdTech firms and users. For the purposes of this report, we define EdTech as software designed to enhance teacher-facilitated learning in classrooms, or to improve students' education outcomes, as well as software or hardware products designed specifically for schools and education systems. Under this conception, a projector for showing images in a classroom or other such generic hardware devices are not considered EdTech, but an adaptive student assessment that children take online, as well as school budgeting software, are considered a part of EdTech.

Figure 4: Indonesia lags behinds peers on digitization and labor productivity
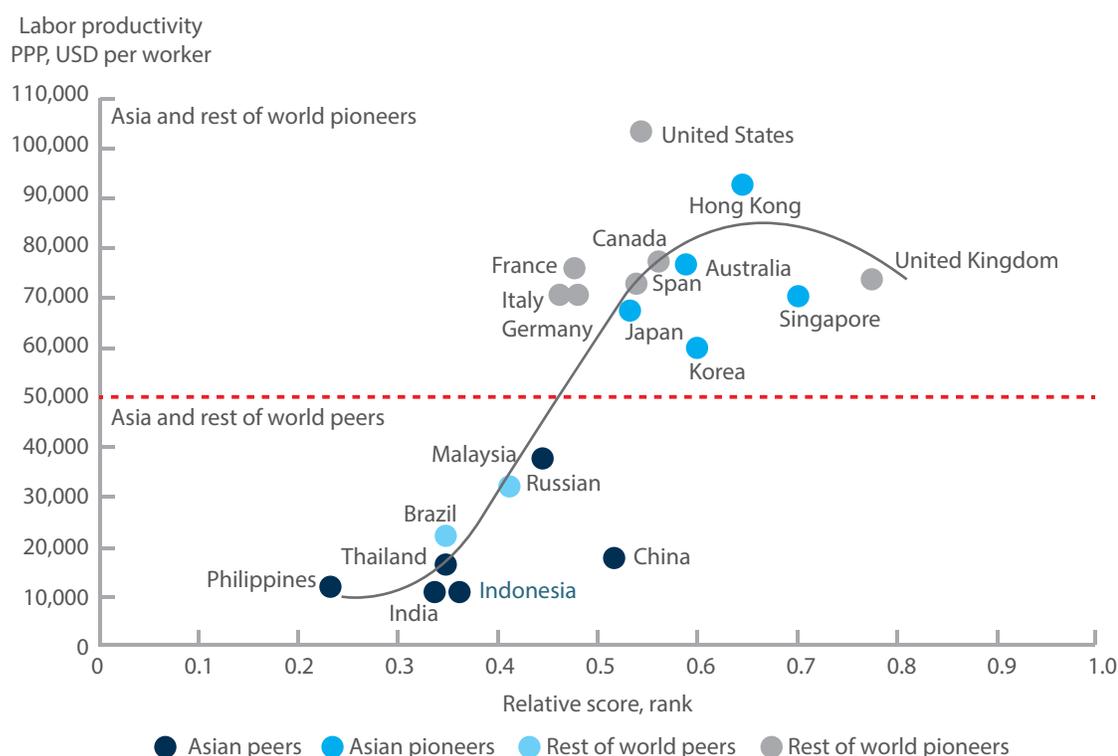
Source: McKinsey (2016).

Note: Relative score refers to the level of digitization ranked against the group of countries in the figure.

02

METHODOLOGY

We drew upon three main sources of information, namely publicly available data, information collected via an online questionnaire sent to 60 EdTech players (Appendix B), and 18 structured, in-depth face-to-face interviews (F2F), as well as a consultation on preliminary findings and recommendations. Our interviews and data collected via surveys suggest that these 60 players represent the vast majority of the EdTech sector in Indonesia.[2] Out of the 60 online questionnaires sent to EdTech players, we received 29 valid responses. Of the 18 F2F interviews, six interviewees did not fill out the survey. Therefore, this report draws on a total of 35 unique EdTech respondents[3] (Appendix A) from surveys and interviews. F2F interviews helped with gathering more qualitative information about the EdTech sector in general, the challenges faced by the EdTech players and other relevant information about firms' growth trajectories. The interviews were followed up with a detailed online questionnaire to gather more quantitative information about the scale of the firms and to obtain inputs to the questions that could not be covered during face-to-face interviews. In addition to the EdTech firms, eight investors (individuals and institutions) were surveyed and two in-depth face-to-face interviews were also conducted. Finally, we also conducted a face-to-face interview with one of the chairmen of the Indonesian EdTech Association (INETA) to understand the various challenges faced by EdTech firms in Indonesia.

A mix of different types of investors, including a family office, VC firms and social impact investment funds,[4] were surveyed.[5] Two F2F interviews were also conducted. The survey responses contain a mix of Indonesia-based and regional investors based in Singapore. Five of the eight respondents have invested in at least one EdTech firm in Indonesia. The surveys and interviews were limited to EdTech firms (and investors) and we leave it for another study to expand the scope to EdTech users.

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2   According to an online analytics portal (https://tracxn.com), there are about 115 EdTech startups in Indonesia. There were significant difficulties in obtaining data via open sources: a total of 71 EdTech companies were identified and only 60 EdTech players could be reached. The operational status of the ones that could not be reached out remains questionable. Although these data cover the majority, there still might be smaller players that could not be identified from primary or secondary sources. We note the data was collected from December 2018 through February 2019, and so may miss some more recent entrants.

3   The remaining 25 companies were not analyzed in detail as they failed to respond to the survey and there were not enough data available from other sources.

4   Impact investments are investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return. Impact investments can be made in both emerging and developed markets, and target a range of returns from below market to market rate, depending on investors' strategic goals (GIIN, 2019).

5   A total of eight responses were received.

03

THE GLOBAL EDTECH SECTOR CONTEXT

Global private investment in EdTech companies has grown significantly over the past three years (Figure 5). The value of investment deals[6] soared to more than US$9 billion in 2017, compared with less than US$3 billion in 2014. The value in 2017 is higher than the cumulative value of investment in EdTech companies since 1997, estimated at about US$38 billion (Adkins, 2018).

Figure 5: Global investment in EdTech companies has skyrocketed in recent years

Deal Totals in
US$ Millions
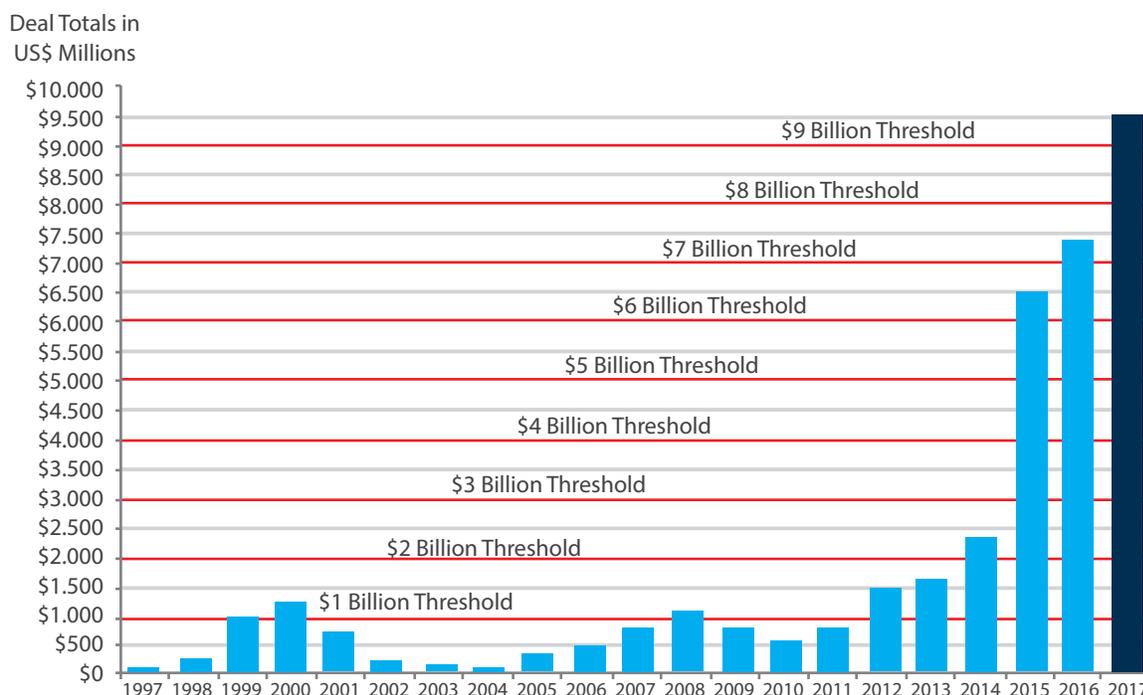
Source: Adkins (2018).

The vast majority of investment has flowed into three countries: (i) the United States, (ii) China, and (iii) India (Adkins, 2018). In terms of categories, investment has tended to flow into EdTech companies that directly target consumer-facing and corporate-facing EdTech companies. These are companies that directly target individual consumers (e.g., self-paced e-learning products) and those that directly target corporate consumers (e.g., EdTech products that are designed for internal employee trainings) (Figure 6). Investment in EdTech firms that target academic institutions (in primary and secondary schools and tertiary education) was significantly lower than the aforementioned categories.

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6   Investment deals include any institutional (such as venture capitalists (VC) or non-institutional (such as angel investment) private sector investment into the startups.

Figure 6: **Consumer companies and corporates attracted the most investment**

Pre K-12
13%

Higher
education
7%

Consumer
41%

Corporate
39%
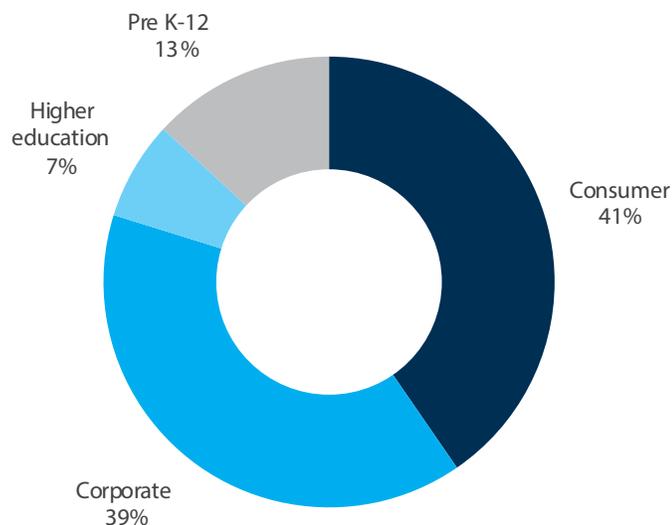
Source: Adkins (2018).

Box 1: **EdTech is a large market globally, but what do these investments actually buy in terms of learning?**

Spending on EdTech in Indonesia is expected to increase dramatically, in line with the sector's development in other countries. How the sector grows will be dependent on consumer demand and preferences, as well as the actions of government and the private sector. Whether Indonesia ends up with an EdTech sector focused on improving student learning for all, or only for those with connectivity and the ability to pay, will depend on choices made in the coming years. Not all EdTech investments will necessarily improve student learning. A recent review by the J-PAL of 126 experimental evaluations (February 2019) found that:

i.   Initiatives that expand access to computers and Internet alone generally do *not* improve kindergarten to grade 12 students' grades and test scores, but do increase computer usage and improve computer proficiency.
ii.   Educational software designed to help students develop particular skills at their own rate of progress have shown enormous promise in improving learning outcomes, particularly in math.
iii. Technology-based nudges that encourage specific, one-time actions—such as text message reminders to complete college course registrations—can have meaningful, albeit modest, impacts on a variety of education-related outcomes, often at low costs.
iv.   Combining online and in-person instruction can work, as well as traditional in-person-only classes, which suggests blended learning may be a cost-effective approach for delivering instruction. Students studying through online-only courses, however, tend to perform worse than students in in-person-only courses.
v.   Many novel applications of technology to education, such as the use of interactive whiteboards or virtual reality, attract wide interest from school administrators but have not yet been rigorously evaluated for their efficacy.

Source: https://www.povertyactionlab.org/sites/default/files/documents/education-technology-evidence-review.pdf

04

A BRIEF OVERVIEW OF THE GOVERNANCE OF INDONESIA'S EDUCATION SYSTEM

As part of the fiscal decentralization process introduced in the early 2000s, education sector management shifted from the central to the subnational level (Rosser, 2018; World Bank, 2018a). The Ministry of Education and Culture (MoEC) has retained responsibility for overseeing public and private pre-tertiary education institutions, along with the Ministry of Religious Affairs (MoRA), while responsibility and financing for actual service delivery have shifted to the subnational level.

Despite committing 20 percent of budget resources to education, Indonesia still underspends as a percentage of GDP compared with regional peers such as Malaysia, Thailand, Vietnam and Mongolia (Figure 7). Spending on IT in the education sector is also low compared with other sectors, as well as peer countries (Figure 8). One undesirable outcome of this low level of spending has been an expansion of low-quality vocational and tertiary institutions that have cropped up to absorb the demand for education that is not being met by the GoI (Rosser, 2018). On the other hand, the gap in the supply of education has also seen a nascent EdTech sector develop over the past 10 years. According to our survey, around 80 percent of all EdTech firms have come into existence since 2013.[7] Growth of the EdTech sector follows the pattern seen across the startup ecosystem in Indonesia and growth of startup assistance organizations (SAO) since 2013 (Bhardwaj and Ruslim, 2018). Similar to many governments around the world, the GoI has acknowledged the importance of incorporating ICT in its education system. As such, in 2006 the National ICT Council was formed, the role of which was to advance e-education (Butcher and Bodrogini, 2016). However, the verbal commitment to incorporating digital technology into the education system has not translated into effective financial commitments. Spending on ICT even within the education sector is significantly lower than spending on ICT in other sectors (Figure 8).

Figure 7: Government expenditure on education

Percent of GDP
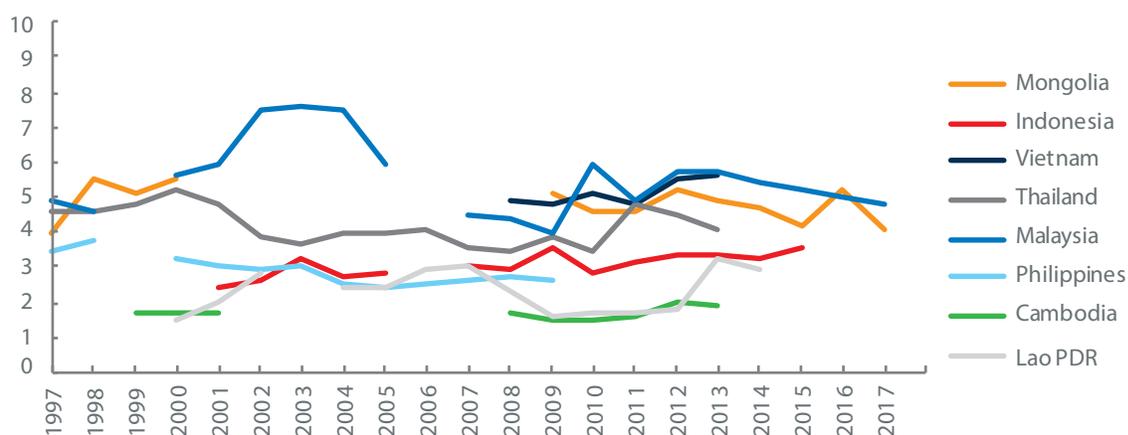
Source: World Development Indicators, World Bank (2020).

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7   Globally, the EdTech sector saw a boom in the number of EdTech companies being formed from 2010 to 2013. However, the EdTech investment space has only seen consistent and strong growth since 2013 (Wan and McNally, 2015). Indonesia's EdTech sector growth seems to follow the patterns seen in the EdTech funding space globally. Although, Indonesia's startup ecosystem is lagging behind the global pattern by 2-3 years but it has caught up to the global frontier at a much faster rate (Google TEMASEK, 2018).

Figure 8: Spending on IT lags other sectors and peer countries

Sector[1] contributon in Indonesia, USD billion, 2015

IT spend per GDP,[2] %

Legend:
- Indonesia: Bottom ● — Top ●
- Peer countries (light blue)
- Developed countries (dark blue)

Scale: 0 5 10 15 20 25 30 35 40 45 50 55 60

Sector	USD billion	Bottom country	Top country
Industrials[3]	436	Indonesia	Hong Kong
Wholesale and retail	117	Indonesia	United States
Government	48	Indonesia	United Kingdom
Transportation	37	Russia	United Kingdom
Business services[4]	35	Russia	Malaysia
Financial services[5]	31	China	United Kingdom
Media and communication	23	Indonesia	United Kingdom
Healthcare	10	Russia	Malaysia
Education	7	Russia	Malaysia
Utilities	6	China	United Kingdom

1 Major sectors. 2 Philippines data is not available. 3 Including agriculture, mining, manufacturing, and construction. Agriculture IT spend is not available. 4 IT-related activities and orther business activities. 5 Banking, securities, and insurance.

Source: McKinsey (2016).

The MoEC, the MoRTHE and the MoRA have governance responsibility to provide oversight to the EdTech sector. The MoEC was given implementation responsibility of the National ICT Council's flagship project focusing on ICT in education in 2006 (Butcher and Bodrogini, 2016). Within the MoEC, management duties for ICT for the education agenda are primarily with the Center for Information and Communication Technology for Education (*Pusat Teknologi Informasi dan Komunikasi untuk Pendidikan,* Pustekkom). Pustekkom was given five key duties as part of its central mandate (Butcher and Bodrogini, 2016).[8] Analyzing these activities (see Box 2), Pustekkom's original mandate was to develop content via various mediums,

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8 The Pustekkom budget in 2018 was Rp 197,753,183,000 as per the Ministry of Finance's (MoF) budget document (RKKL DIPA Kemdikbud, 2018) for the MoEC. This allocation covers multiple areas, e.g., enhancing school connectivity, development of digital learning resources, improvement of educators' ICT skills, and improvement of ICT use for teaching and learning.

including radio, television and computer-based multimedia (Butcher and Bodrogini, 2016). It appears to have faced challenges in adapting to the new mandate of incorporating ICT into education, given that it previously had a content development role. These areas of responsibility overlap closely with the product and service offerings of EdTech firms.[9]

<table>
<tr><td>Box 2:   Pustekkom's five main areas of responsibility</td></tr>
<tr><td>

- The provision of ICT infrastructure and facilities and ICT-based learning content for the strengthening and expansion of e-learning at all levels of education.

- Development of e-management, e-reporting, and e-services to enhance the effectiveness of governance and public service.

- Development of knowledge management systems to facilitate the sharing of information and knowledge among learners and educators.

- Development of ICT-based learning resource centers in elementary and secondary education.

- Increasing human resource capacity to support the efficient use of ICT at the central and local levels.

</td></tr>
</table>

Source: Adapted from Butcher and Bodrogini (2016).

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9   See discussion later in this report about the main products and services offered by EdTech firms.

05

INDONESIA'S PRIVATE EDTECH SECTOR LANDSCAPE

Growth of the Indonesian EdTech sector follows a similar trajectory to that seen in the global EdTech investment sphere. The majority of EdTech firms were founded in the past six years (Figure 9). The rapid increase in firm establishment also coincides with a steep trajectory in the internet penetration rate in Indonesia. The survey data also reveal that the median number of years of operation is around four years and the number of years a firm has been operational does appear to have a mildly positive correlation[10] with profitability. The firms that indicated they were profitable had been operating for around five years. This makes intuitive sense, since our survey has 'survivor bias' (we did not include firms that failed and went out of business), and because capital for EdTech startups is scarce in the Indonesian context, so firms that are not profitable are not likely to be able to sustain themselves for long.

Figure 9:   The private Indonesian EdTech sector has sprung to life over the past six years

Number of new firms　　　Internet penetration ratio (%) (RHS)
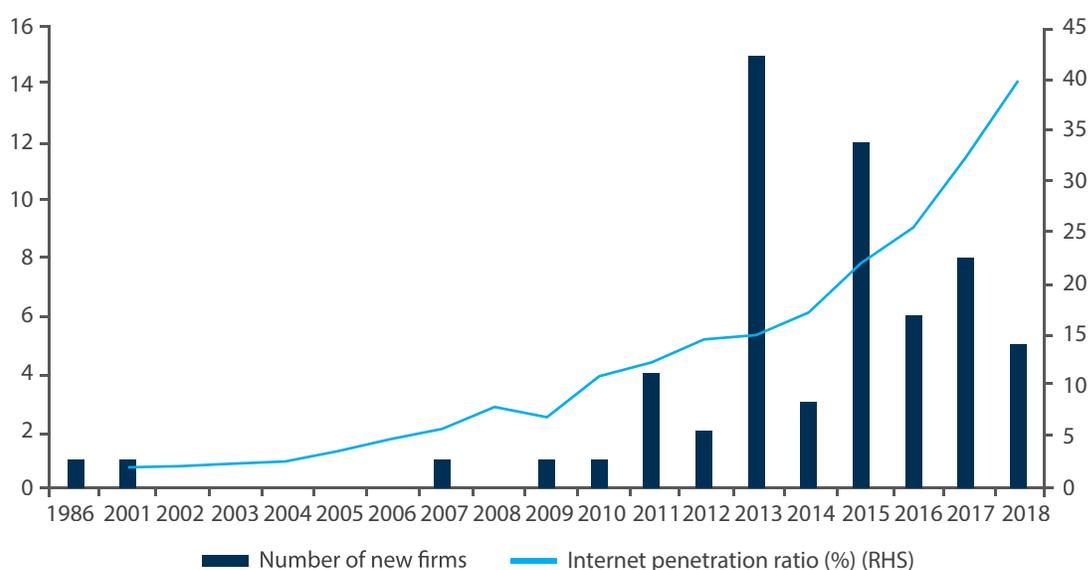
Source: World Bank staff calculations from survey, interviews and desktop research, World Development Indicators (World Bank, 2018b).

5.1 Key product and service offerings

EdTech firms in Indonesia offer a wide variety of products and services, targeting different users, including parents, educators, students, educational institutions' managements and corporations. These exist and may overlap with free products produced by the MoEC, for example, as well as open education resources (OER) provided by Universitas Terbuka, among others. For the most part, Indonesian EdTech products aim to help students with learning and upskilling, educators with student management, communication and teaching and educational institutions with administration (Figure 10). For example, companies such as Ruangguru, Zenius and Quipper develop and provide self e-learning content, interactive learning platforms and study tools that help K-12 students expedite the learning process, along with interactive online services that help students with their assignments and test preparation. Companies such as Arsa Kids, Digikids and Educa Studio develop game-based and blended learning experiences,

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10   Correlation coefficient of 0.38.

including interactive storybooks and educational mobile apps, to help improve early childhood educators' effectiveness. Appendix C provides more details on the type of products and services offered by the main Indonesian EdTech companies. These products and services are typically disseminated using several approaches, such as web-based and mobile-based applications. The heterogeneity in Indonesia's EdTech sector is potentially indicative of the breadth of the gaps in Indonesia's education system. On the upside, it also points to the number of opportunities available for the private sector to contribute to bridging those gaps.

Figure 10: **Indonesia's EdTech sector landscape[11] offers a wide range of products and services**

Source: Surveys, interviews and desktop research.

Most Indonesian EdTech firms offer more than one product or service, so that they can offer more comprehensive support to their target groups (Figure 11). Many of the EdTech firms surveyed offered administration and management products targeted for educators or institutions, such as learning management systems (LMS) (30 percent), online learning courses (27 percent), and career development or vocational online learning (25 percent). The survey results reveal that product offerings can be categorized into two broad groups: those aimed at students and those aimed at education providers. The products and services offered to education providers were clustered around administration and management-related offerings. The products and services offered to students tended to be for online learning, test preparation, upskilling and career development/planning style support. While over 40 percent of companies do not

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11 In total, the 60 identified EdTech firms offer 28 different types of products and services (Figure 11), which were bucketed into 16 categories based on their core functionalities (Figure 10).

emphasize one type of content over another, they tend to focus more on technology-related skills such as programming and coding, rather than on traditional subjects such as social sciences, science and languages (Figure 12). This is interesting, as it once again points to the fact that gaps in the education system are not concentrated in one particular subject space.

Figure 11:   Diversity in product and services offered by the EdTech companies in Indonesia

Distribution of firms by products offering (percent of survey respondents)
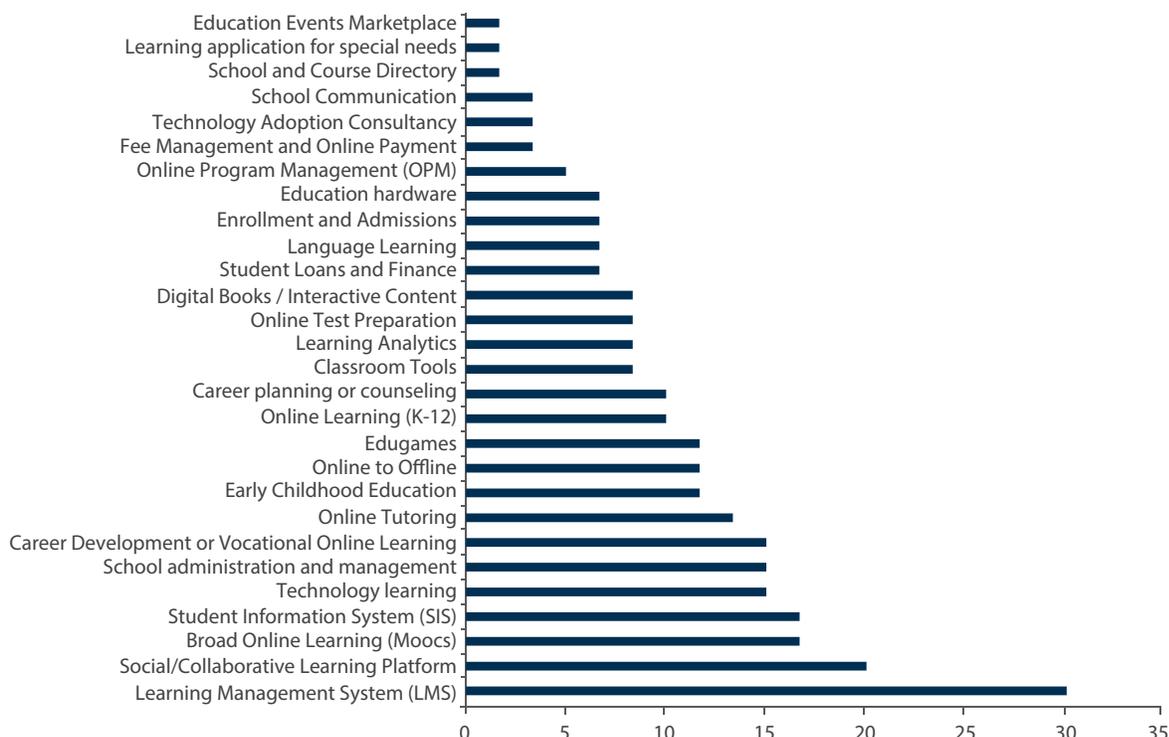
Source: Survey and World Bank staff calculations.
Note: Survey respondents were given the opportunity to select more than one option, hence percentages sum to more than 100.

EdTech firms do not appear to be targeting critical gaps in mathematics, science and reading. Less than 15 percent of the surveyed firms offered specific content focus on mathematics, science and reading. Indonesia performs poorly across these three categories (which are the three categories that the PISA international tests focus on). Indonesia ranks 70 out of 78 countries on PISA in science, 71 for mathematics and 72 for reading. These three subjects (with 'language literacy' being used as a proxy for reading) are not ranked highly in terms of *exclusive* content focus of EdTech firms. For example, in terms of exclusive subject offering, mathematics was offered by 13 percent of companies, science was offered by 15 percent, and reading was offered by 12 percent. It also indicates that the majority of EdTech firms in Indonesia are targeting a breadth of product and service offerings rather than offering fewer products and services with greater depth. If only core products and services offerings are considered, then the EdTech sector can be decomposed into 16 main product categories (Figure 11).

Figure 12: **Almost half Indonesian EdTech firms cover multiple topics**

Distribution of firms by topics (percent of survey respondents)
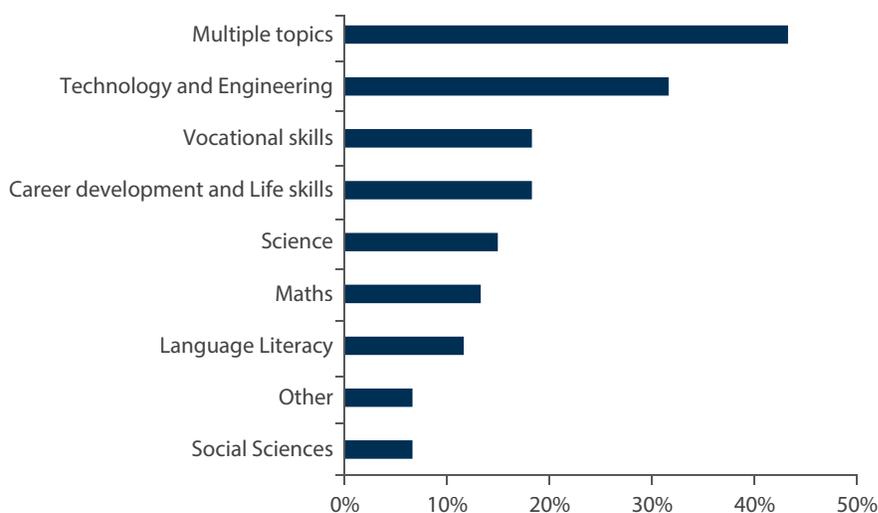
Source: Surveys and interviews.

Figure 13: **Delivery mode of the different products offered by EdTech firms**
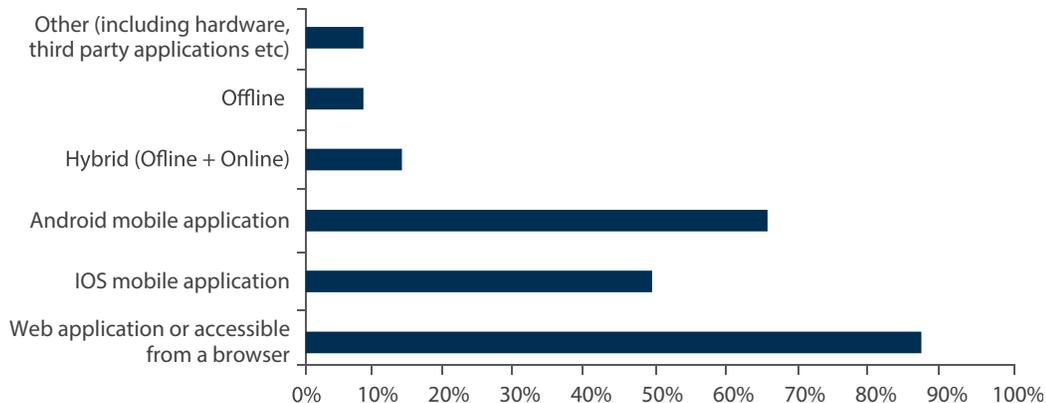
The majority (Figure 13) of the EdTech firms offer product and service offerings that are accessible via a simple web browser. Mobile-based EdTech applications are a rising trend among EdTech firms but because of the lack of IOS and Android engineers in the market, creating and maintaining a mobile application is cost intensive.

Unsurprisingly, the Jakarta market has the highest penetration by EdTech firms (Figure 14). The vast majority of EdTech firm products focus on markets on the island of Java—Indonesia's most populous island. Smaller populations (and thus smaller markets), as well as lower incomes and poor digital infrastructure deter

EdTech firms from disbursing their products into other locations. This means that Indonesia's EdTech market is currently inequitable, a situation that is likely to persist and possibly worsen in the absence of concerted action.

Figure 14:   EdTech market coverage is concentrated in the Jakarta region

Distribution of firms by geographic penetration of their products (percent of survey respondents)
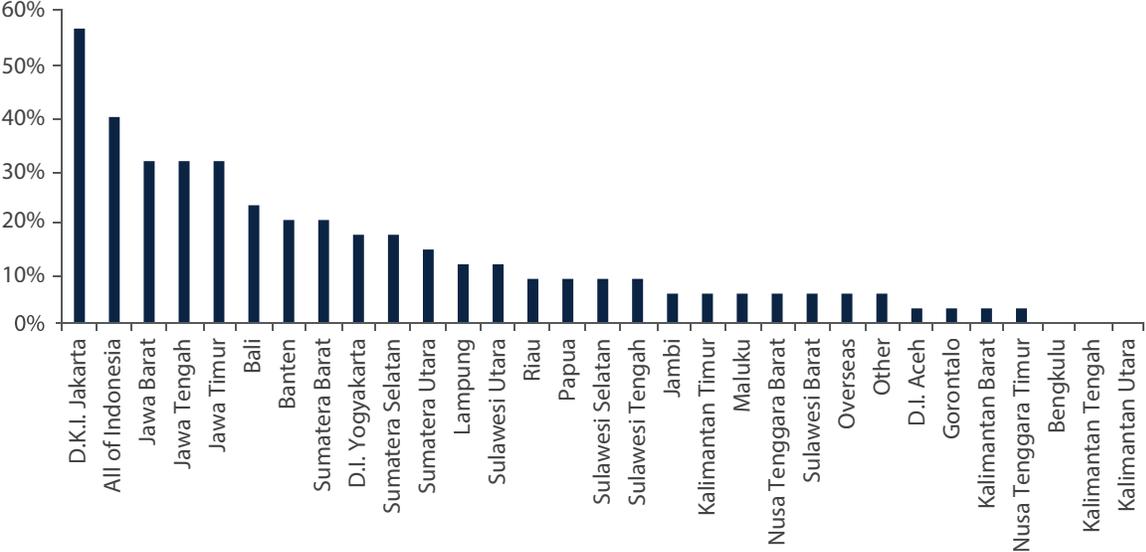
Source: Surveys and interviews.
Note: Respondents were allowed to pick more than one response.

5.2 Target market

Products and services offered in the EdTech sector typically target junior high schools, senior high schools, higher education institutions and professionals (Figures 15 and 16), with few or no products in the primary or pre-primary sectors, or technical/vocational education. The reason for targeting higher levels of education is that the barriers to getting through to consumers are slightly lower than trying to target more junior students. For example, for high school students, the interviews conducted for this study revealed that high school teachers cared about learning outcomes (more so than primary school teachers) and therefore many firms' marketing strategies focused on persuading these teachers to purchase products and services. In the case of senior high school students, the targeting strategy was based on the assumption that these students cared about obtaining good grades in university entrance exams. In fact, *more than 80 percent of (student) consumers were actually students in grades 11 and 12, and students preparing for university and college entrance exams (often referred to as grade 13)*. This parallels the markets in other countries, for example China, where the college entrance exam (*Gaokao*) is seen as a major driver of the EdTech sector. Many Indonesian EdTech firms also offer administration and learning management systems for education providers or educators. These typically fall into three main categories: school administrators, university management and corporates. In terms of how widespread these products are, the 35 EdTech startups

studied in depth currently support more than 2,160 educational institutions and serve more than 9.7 million students/individual users across Indonesia.

While product/service offerings are quite heterogeneous, most EdTech firms directly target students as end-users. Almost 90 percent of EdTech firms targeted their products and services to students and around 85 percent had more than one target (Figure 15). Interestingly, less than one-third of the survey respondents indicated that they targeted[12] parents. Parents play a significant role in dissemination of EdTech products, especially for primary school and junior high school students. Furthermore, many school administration and student finance products may be linked to parents as decision-makers, as they may be expected to support the school to cover the costs of new products. Given that a significant proportion of EdTech users are school-aged students, this lack of targeting of parents was an interesting result. It could explain one of the reasons why many EdTech firms were finding it difficult to generate profits,[13] and to even persuade users to move to paying for products and services.

Within formal education institutions (such as schools, universities and training institutes) EdTech firms typically targeted senior students, especially those in their final years of schooling (grades 10 to 12) and those in university (Figure 16). One striking outcome was that only a single EdTech firm targeted public education providers (schools or universities) exclusively. *In contrast, around one in four EdTech firms exclusively targeted private sector education providers.*[14] The majority (about 60 percent) targeted both public and private sector institutions. Given that two-thirds of survey respondents were generating revenues but not profits, it is not surprising that, on average, only 49 percent of EdTech users were paying for the products and services they were consuming (Figure 17). The survey data also suggest that the number of free users tends to decrease as the startup matures. Many EdTech firms in Indonesia have adopted a "freemium" pricing[15] model as a means of attracting more users by providing a teaser for users to first try the product. This has served as an efficient method to attract new users but has been detrimental to the financial health of the EdTech firms, as less than 3 percent[16] of those using the free versions of the products actually ended up upgrading to the paid versions. The business models in the EdTech sector (e.g., freemium, subscription, ad-based, purchase, educational licenses) are expected to continue to evolve as EdTech companies explore different pricing strategies to attract and retain more users, and to achieve financial sustainability.

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12   The term 'target' used to indicate the group on whom firm marketing strategies were focused on.

13   Further details later in the report.

14   Many interviewees indicated that targeting private sector educational institutions is a better dissemination strategy because private schools have higher capacity and are more willing to pay for products compared with public sector schools.

15   Freemium pricing is the strategy where a company offers basic services for free and charges a fee for enhanced features or content.

16   Authors' own estimation derived from interview and survey data.

Figure 15: EdTech firms targeted several user groups

Percent of survey respondents
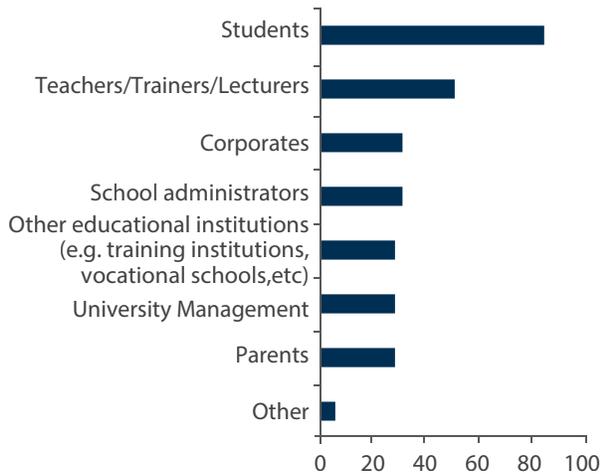
Figure 16: EdTech firms tend to target older students

Percent of survey respondents

Source: Survey and World Bank staff calculations.

Note: Survey respondents were given the opportunity to select more than one option.
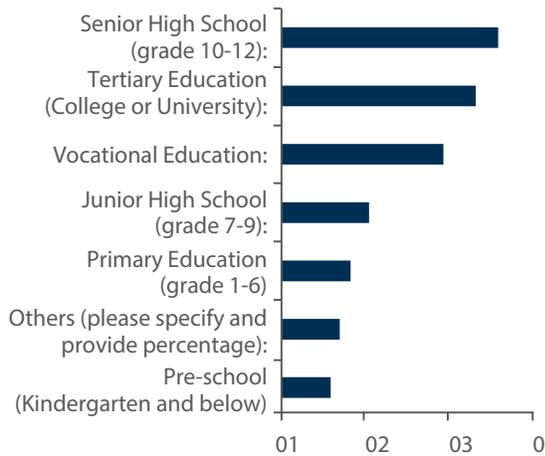
Figure 17: Only 49 percent of EdTech users paid full fees for the products[17]
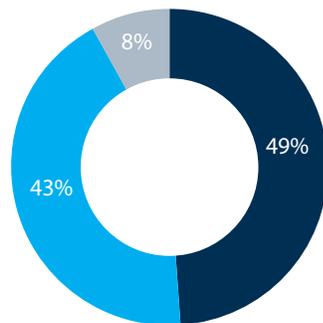
Source: Survey and F2F interviews.

The majority of EdTech firms engaged with the government at multiple stages of their operations. Almost half of those firms that did engage with the government did so at the ideation or product development stage (Figure 18). A similar proportion of EdTech firms indicated that their involvement with the government was more from a customer and partnership perspective. Acquiring government licenses was another channel through which some EdTech firms engaged with the government.

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17 The survey respondents were asked to provide percentage distribution of their paid, subsidized/discounted and fee users. The question that was asked was: What percentage (approximate) of your current customer base would be considered the following:(The sum of all entries should be 100). Then, the aggregate sum of each categorical distribution was divided against the total sum (100 x number of responses) to get the percentage.

Figure 18: EdTech firms' engagement with government

Distribution of firms by engagement with the government (percent of survey respondents)

Category	Value
No, did not engage with the government at all	25.9
Yes, at the ideation stage	22.2
Yes, partnership for service provision and dissemination of our product	14.8
Yes, government is our customer	14.8
Yes, at product development stage	11.1
Yes, other	11.1
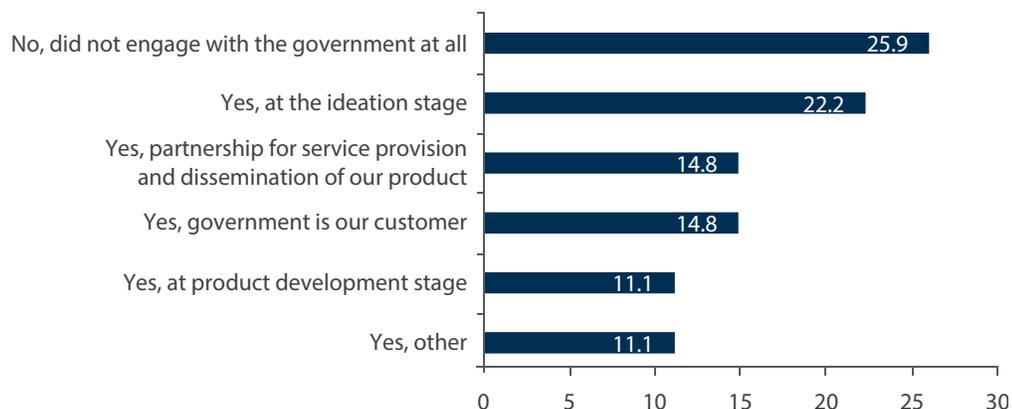
Source: Survey and interviews.

Box 3: Example of acquiring accreditation for online courses[18]

Acquiring licenses to become an accredited education provider is one way for EdTech firms to interact with government. As noted earlier, many EdTech firms were established to addressed gaps in Indonesia's education system. However, in order to *officially*[19] fill gaps and therefore to attract a critical mass of customers, EdTech firms need official accreditation from the government. In the case of official accreditation in the higher education sector, licenses need to be obtained from the Ministry of Research, Technology and Higher Education (MoRTHE). The challenge here is that the MoRTHE previously did not provide accreditation for completely online courses. Under existing regulations there is a two-step process that firms need to undertake before they can deliver 100 percent online courses. The first step is to provide a blended option (online and offline) for a probationary period. The probationary period is usually a minimum of one year[20] and the online content can be up to a maximum of 49 percent of the total course content. At least 51 percent of course content must be delivered offline, which matches with international better practices (WDR, 2018; JPAL, 2019). Once the probation period is over, the second step involves applying for the license and course accreditation. However, even if the probationary requirements are fulfilled, there is no guarantee that the license to operate as a higher education service provider with a government accredited course will be granted. We note the new *Kampus Merdek*a policy introduced in January 2020 of the Ministry of Education and Culture, which now controls higher education, is likely to make licensing simpler and faster.

Source: Face-to-face interview with EdTech firms, interviews with MoEC staff.

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18 This case study presents the recent experience of a large EdTech firm in attempting to acquire licenses to provide fully accredited online courses. The name of the firm has been withheld to preserve anonymity, at the request of the firm.

19 Official refers to government accredited courses that are formally recognized (such as diplomas, and bachelor's degrees).

20 There is no official length for the probationary period. Experience by the surveyed firms indicates that, on average, it lasts around one to one and a half years.

5.3 Business models

The majority—62 percent—of the EdTech firms surveyed use a freemium pricing strategy, or offer a free-trial period to maximize their outreach and attract new users. This means that either they initially offer some basic features or content for free, or provide full-feature/content for free for a limited time before they start charging a customer. This practice of the freemium model or offering a free-trial period has many times proven detrimental for the firms in terms of generating revenues, because most free users fail to upgrade to paid accounts after the trial period ends.

The vast majority of Indonesian EdTech firms are not yet at the profit-generating stage. About 89 percent (22 of 35) of EdTech firms are generating revenues, of which only 27 percent are profitable. In total, eight of the 35 firms included in this study consider themselves profitable. There is a moderately positive correlation between years of operation of a firm and profitability. A combination of F2F interviews and survey results suggests that, on average, it takes about five years for EdTech firms to become profitable in Indonesia. Further supporting the finding that EdTech firms have an eclectic approach to growing their businesses, about 60 percent note that they utilize three business operating models: (i) business-to-business[21] (B2B); (ii) business-to-consumer (B2C); and (iii) business-to-business-to-consumer (B2B2C).[22] The most common business operating model for EdTech firms is the B2B approach. Only a handful of EdTech firms involve the government in their business operating model. This means that they do not often partner with schools or relevant government authorities when designing products and services, as this can be time-consuming and bureaucratic. This finding suggests that EdTech firms have relatively agile business operating models. However, it could also indicate room for operational efficiency gains if EdTech firms concentrate on one particular business model.[23] Further exploration of the rationale behind having multiple business models via the survey and F2F interviews potentially hints to business opportunism, as opposed to a specific strategy underpinned by a longer-term vision of business expansion as the main rationale for adopting multiple business operating models.

Several of the interviewed EdTech firms noted that their costs (specifically, customer acquisition costs [CAC]) were a major consideration when deciding upon a hybrid business operating model. For example, there were significant economies of scale when using a B2B model, especially with regards to targeting schools. By targeting a school, EdTech firms faced one set of fixed costs and could easily scale up operations. They noted that it was significantly cost-intensive (both money- and time-wise) to focus only on a B2C model and target individual students.[24] To reduce barriers for EdTech users, one point of commonality between almost all EdTech firms was that they considered the level of digital literacy required to access their products or services to be very basic.

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21 The target customers for B2B products can vary from being educational institutions (such as schools, universities or training centers) or corporates.

22 B2B2C is a distribution and dissemination strategy where rather than outreaching to the end-consumer (e.g., learner or student) directly, they are accessed via another business that has existing user base (e.g., schools or educational institutions). Indonesian startup ecosystem has witnessed many startups shifting their business strategy from B2C to B2B2C.

23 Often, targeting multiple business models can confuse the existing team and blur the vision of the company because both B2C and B2B require different marketing strategies and product specification requirement. Splitting the existing resources in two different strategic directions can often cause operational inefficiencies.

24 There is a range of marketing strategies that EdTech firms rely on to attract and acquire consumers. These strategies range from word-of-mouth, online via ads, social media campaigns and offline by information seminars in partnership with schools or educational institutions or direct offline sales.

The majority of EdTech firms (90 percent) changed their original business models after identifying new gaps in the sector and to achieve greater cost-efficiency.[25] The F2F interviews revealed that many EdTech firms changed their business model and products/service offerings from the time they were established. One reason for this change in approach was that initial market research conducted by the founders revealed one set of problems (for which they set up their companies to resolve) but, once they were in operation, they found that other gaps existed and needed to be resolved before the originally identified problem could be addressed. For example, many EdTech firms initially had a student-centered approach. They had identified gaps or opportunities in the education system from a student's perspective (e.g., exam preparation, vocational skills to improve job prospects, etc.). However, compounding these problems were issues on the supply-side: the educators. As noted earlier, *many EdTech firms offer products and services (such as learning management systems) to educators to address gaps on the supply-side, because an increased take-up of digital technology in the education sector is difficult without addressing supply-side hurdles first.*

Figure 19: Reasons for business model changes and pivots
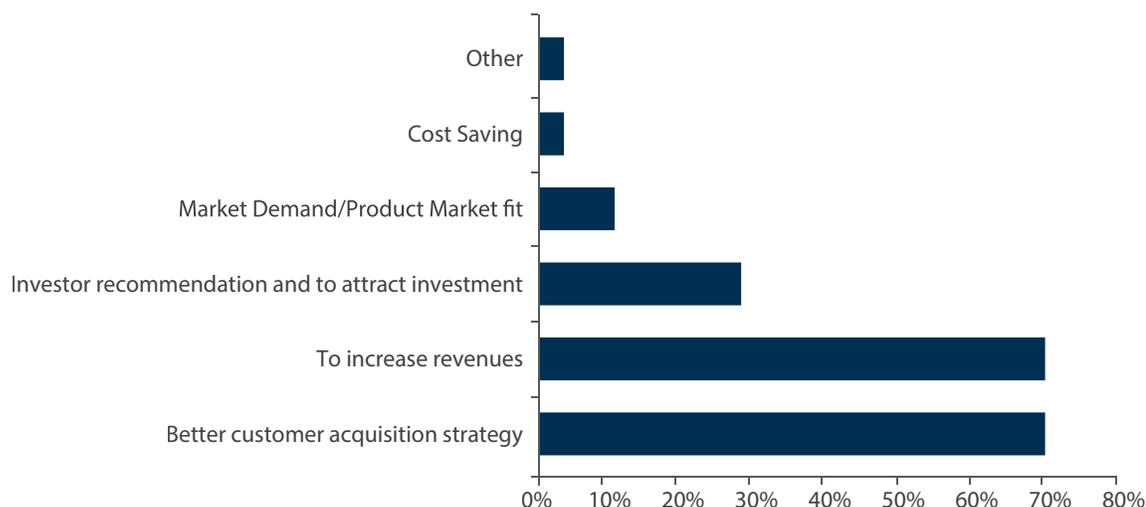
Source: Surveys and interviews.

Changing business models, products and services was not just motivated by market demand, but also as a customer acquisition strategy, or to improve their unit economics[26] as a requirement from investors, or to become more attractive as an investment opportunity for investors (Figure 19). For example, many EdTech firms initially set up as a B2C business model and eventually moved toward being B2B or B2B2C, because B2C models are more cost-intensive, while B2B or B2B2C models can provide them with consistent sources of revenue while leveraging the exiting user base of their partners (such as schools or educational institutions). Initially, it may be easier in terms of accessibility to acquire an individual end-user compared with partnering with a business. However, in terms of scale of impact and reach, targeting

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25 This indicates that the EdTech sector in Indonesia is still in a nascent stage. There have not been any proven business models because the educational technology is a relatively new concept that requires pedagogical and institutional changes. Many companies are still trying to experiment with different business models and dissemination strategies to achieve higher outreach and financial sustainability. This trend can also be seen in other sectors across the startup ecosystem that require behavioral and mindset changes, for example, the FinTech and HealthTech sectors.

26 Unit economies refers to costs and revenues associated with a particular business model.

a business customer (B2B/B2B2C) makes more business sense, with higher impact and outreach potential. Hence, EdTech firms compare the cost of acquiring an individual customer with the cost of acquiring a business, comparing the two against the potential impact and potential reach in order to prioritize business strategy.[27] This shift from B2C to B2B is a common trend seen in the Indonesian startup ecosystem across different sectors, more specifically among impact-focused technology startups and other social enterprises. One of the main reasons for higher CAC in B2C models is also due to the novelty of the EdTech sector, and the fact that it requires more time and resources to influence behavioral and pedagogical shifts.

EdTech firms acquire capital from a variety of sources (Figure 20). More than half of the firms surveyed indicated that they had acquired funding from more than one source. The most common source of external funding was from angel investors, followed by VC firms. The variety of sources for capital provides a hint to one of the challenges faced by the EdTech sector, which is to attract and sustain external funding. It also hints to the fact that the scale of funding is on the low side. This is because a single source of funding (or just a couple of sources) does not appear to fulfill the capital needs of most firms. This is also particularly the case given the context that the EdTech firms are often viewed by capital providers (such as VCs) as social enterprises, whose objectives are not necessarily about generating high profits (and, consequently, high returns).

Figure 20: Funding is sought from a variety of sources
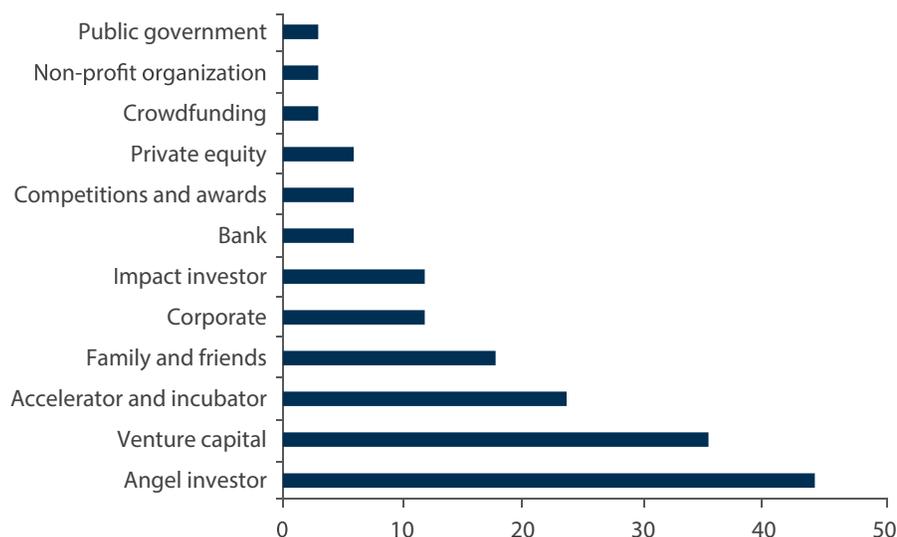
Source: Surveys.

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27 Partnering with businesses or education institutions (such and school and universities) mostly requires direct sales and business development costs. It is hard to comment on the exact cost of acquiring a business customer but some ballpark figures were shared by the interviewees. For example, it takes around Rp 500,000 to Rp 1 million to acquire one business customer. A single business customer can provide access to 1,000 students (if the business is a school), 10,000 learners (if the business is a corporate) or around 50+ teachers/educators. Acquiring individual users can require multiple strategies ranging from offline marketing efforts to online marketing efforts, which can have varying cost, but because of the novelty of the EdTech sector, return on marketing investment often remains low for B2C strategies.

5.4 Founders' characteristics

The founders of Indonesia's EdTech firms tend to be highly educated males, with high rates of post-graduate overseas education. Around 95 percent of the founders in our survey had at least a bachelor's degree and just over 40 percent had an advanced degree (master's and/or PhD). Furthermore, 69 percent of EdTech firms studied had at least one founder who had completed some form of their education overseas. In the F2F interviews, several founders mentioned that exposure to foreign education systems had provided them with some inspiration and had given them a clearer sense of the gaps in the Indonesian education system that needed to be filled. The data suggested that there is a slightly positive correlation between overseas educated founder and profitability potential of the firm.[28] In terms of gender balance, only 35 percent of firms had at least one female founder. Another characteristic of founders in the EdTech sector is that the majority appear to have been serial entrepreneurs, having either founded a startup, worked in one or invested in one (Figure 21). Notwithstanding prior startup sector experience, just under two-thirds of founders did not have any prior experience in the education or the EdTech sector.

Figure 21: Many EdTech founders are serial entrepreneurs

(Percent of survey respondents)
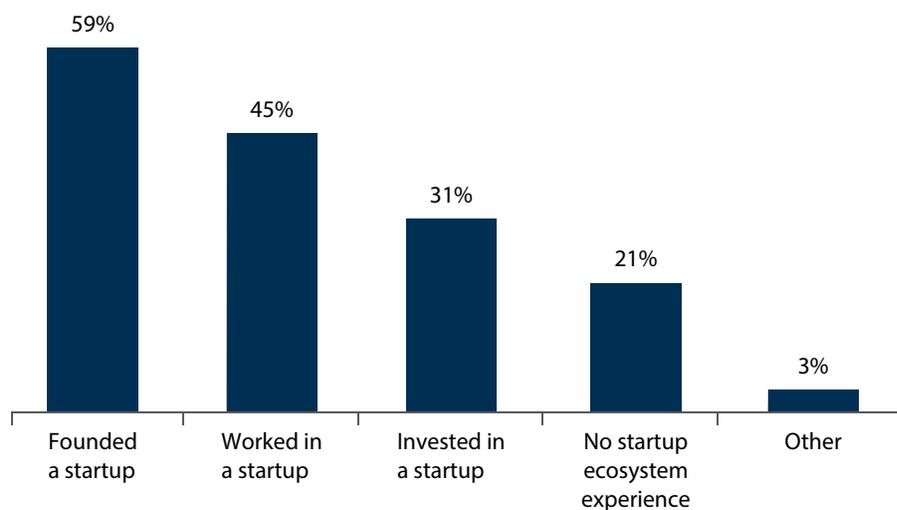
Source: Surveys and interviews, World Bank staff calculations.

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28   Anecdotal evidence suggests that there is a positive correlation between overseas education and success of the startup firm across different sectors in the Indonesian startup ecosystem.

06

INVESTORS' PERSPECTIVE ON INDONESIA'S EDTECH SECTOR

Investment firms play an important role in providing much needed capital to startups. The Southeast Asian region is a particularly attractive region for venture capital investors and is a high growth market (Google-AT Kearney Indonesia VC Outlook Survey 2017). While Singapore dominates the market in terms of the number of investment deals and value, Indonesia is growing quickly (Figure 22). Nonetheless, the EdTech sector in the Southeast Asian region, as a whole, is seen as still being in the early stages of development, well behind other Asian markets such as India and China. For example, the 2018 e-economy Southeast Asia report from Google and Temasek did not include EdTech, as it is considered a "nascent sector" in the region.

Figure 22: VC activity in Indonesia is growing
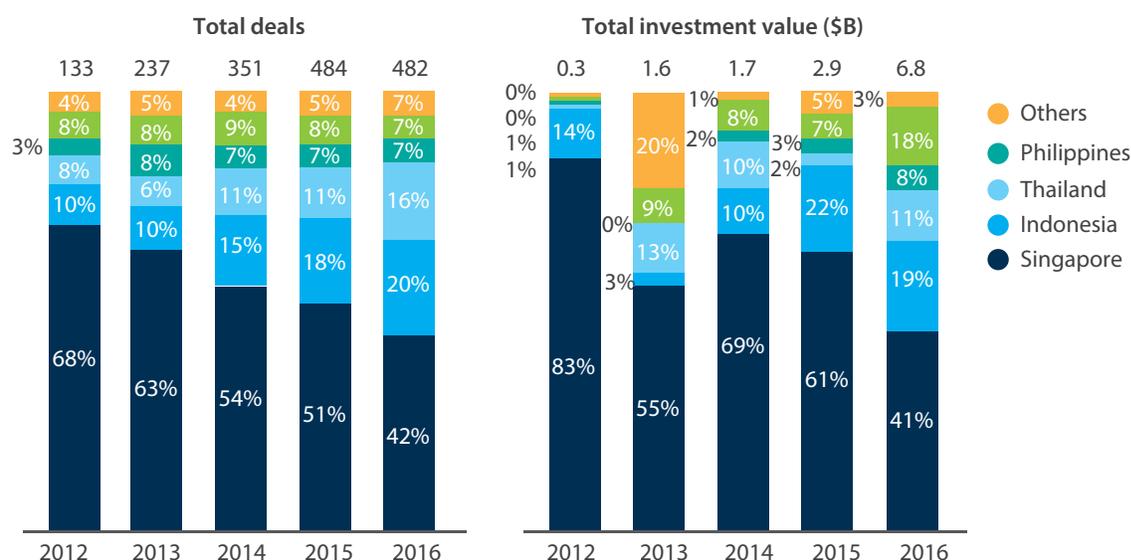
Source: Google-AT Kearney Indonesia VC Outlook Survey 2017.

EdTech firms do not feature highly in sectors that VC investors are currently involved in. VC involvement is focused heavily on e-commerce and transport (Figure 23). The EdTech sector also does not yet feature heavily in the short- to medium-term future plans of VCs—F2F interviews indicate that part of the reason for this is that EdTech firms are still seen as more of a charitable endeavor than profit-making. In terms of the outlook, the FinTech sector is increasingly attracting VC attention and, to a lesser extent, so is the health-care sector (Google-AT Kearney Indonesia VC Outlook Survey 2017) (Figure 24).

Figure 23: **E-commerce and transport attract the most interest from VCs**

Breakdown of number of deals

Ecommerce	42%
Transport	4%
Finance	8%
Classified/directory	10%
Payment	5%
Others	31%
Grand total	100%

Breakdown of % of total investment value

Ecommerce	58%
Transport	38%
Finance	1%
Classified/directory	1%
Payment	1%
Others	2%
Grand total	100%
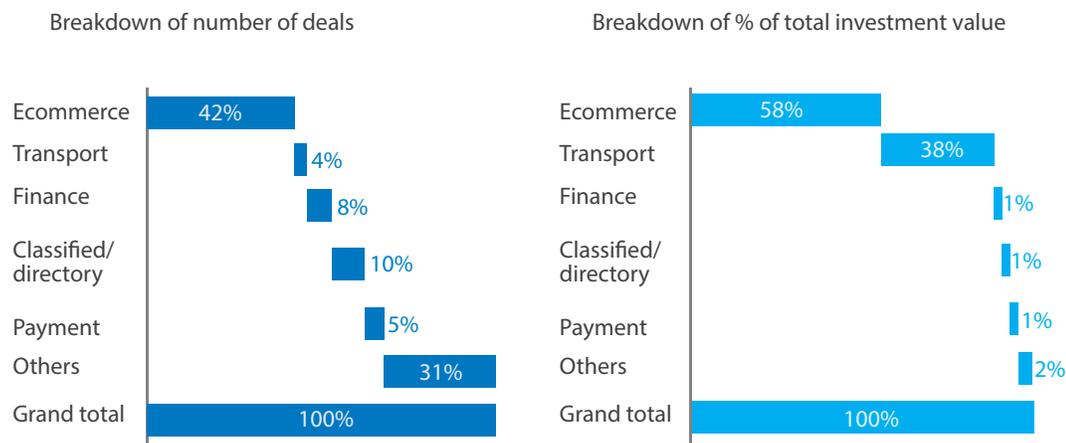
Source: Google-AT Kearney Indonesia VC Outlook Survey 2017.
Note: Indonesia deals by category, 2012 to August 2017.

Figure 24: **The investment outlook is most positive for the FinTech and health-care sectors**

Top two categories to invest in (% of responses)

Local investors

FinTech	Healthcare
64%	29%

Foreign investors

FinTech	Healthcare
70%	20%

Top two categories to decrease investment (% of responses)

Local investors

E-commerce	Social media
43%	21%

Foreign investors

E-commerce	Social media
60%	10%
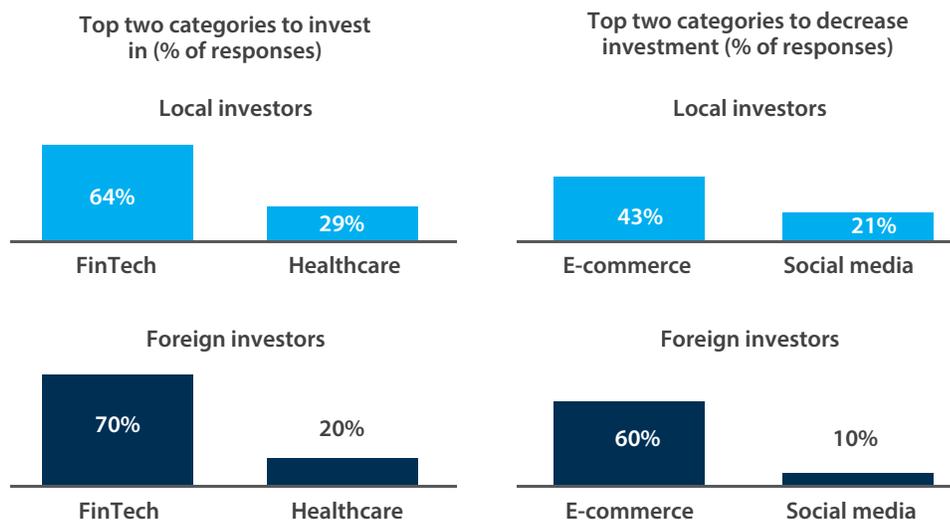
Source: Google-AT Kearney Indonesia VC Outlook Survey 2017.

There are two main types of investors involved in Indonesia's EdTech sector:

1. Investors who focus on economic returns without attributing any value to social returns. For such investors, commercial returns hold higher value than social returns. Most VCs and private institutional investors fall into this category.
2. Investors who invest 'grant money' to maximize social returns and hence exclude 'for-profit' organizations.[29]

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29   https://www.britishcouncil.org/sites/default/files/asean_social_enterprise_structuring_guide_guide_final_web_version_0.pdf

Impact investors fall into the middle of the two categories above, but they are only a small group of players in the investment space in Indonesia. Impact investors are investors that invest in for-profit organizations that value higher social returns over commercial returns (social enterprises). However, despite the potential for substantial social impact, most impact investors still look for market-rate returns from their investments and very few impact investors are willing to compromise on the financial returns (GIIN, 2019). Furthermore, since 2014, most private impact investors have largely directed their investments into the financial services sector (specifically the FinTech sector) and the agriculture sector. According to the GIIN (2018) report, the education sector (specifically EdTech) and workforce development are two emerging sectors in Indonesia in terms of attractiveness to private impact investors. Notably, the EdTech sector attracted substantial momentum in terms of impact investments in 2016 and 2017.

The general perception among investors regarding the EdTech sector in Indonesia is that there is huge market potential. However, despite many EdTech firms existing since 2012, the sector has not seen much growth and most firms are still at the seed or pre-series A stage of investment.[30] According to investors, despite the huge potential and large potential market size, the main challenge for the EdTech sector is that there has not yet been a locally proven business model that can create a balance between seemingly mutually exclusive objectives of social impact and profitability. In consultations for this report, there was consensus that once a model proved profitable at scale, investment would flood into the EdTech sector in Indonesia.

EdTech firms in Indonesia are currently experimenting with business models that can help them to achieve commercial returns, while balancing this with the social returns to the education sector. There is also no existing industry benchmark to gauge sustainability and scalability of the monetization potential of existing business models. This is a deterrent for investors looking for investment opportunities that provide them with high returns, or a clear path to profitability in the medium to long term. Unlike other technology-based sectors, EdTech firms have a greater focus on social impact and, therefore, their market is not inherently a high profit-generating sector. This naturally then poses a challenge for EdTech firms in terms of attracting potential investors. Therefore, one of the biggest challenges that EdTech firms face is how to market and package themselves—as a social enterprise[31] or as a traditional technology startup. The main implication of being categorized as a pure social enterprise would be more realistic expectations among the investors regarding the return on investment, because of the firm's greater focus on social returns vs. commercial returns. This strategy could also discourage investors whose focus is solely on commercial returns. On the other hand, marketing EdTech firms as traditional technology startups may not be able to justify the relatively lower returns.

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30 Seed rounds are among the first rounds of funding a company will receive, generally while the company is young and working to gain traction. Round sizes range between US$10,000 and US$2 million, though larger seed rounds have become more common in recent years. A seed round typically comes before a company's Series A round (Glossary from Crunchbase: https://support. crunchbase.com/hc/en-us/articles/115010458467-Glossary-of-Funding-Types).

Series A and Series B rounds are funding rounds for earlier stage companies and range on average between US$1 million and US$30 million (Glossary from Crunchbase: https://support.crunchbase.com/hc/en-us/articles/115010458467-Glossary-of-Funding-Types).

31 Social enterprise is an entrepreneurial venture with an embedded social purpose. They are for-profit organizations that intend to solve social or environmental problem with an entrepreneurial mindset to grow both the business and the impact.

Most EdTech firms can be categorized as social enterprises because of their focus on social impact in addition to financial returns. Therefore, another reason for lower investment into the EdTech sector is because the social enterprise market is still underserved by the existing financial structures and investment instruments. Investment in the form of pure debt can be very challenging for enterprises to pay back, while investment in the form of pure equity demands more return. There is an opportunity to use different financing structures, other than pure debt or pure equity, to boost investment into the EdTech sector; for example, revenue-based financing, royalty-based financing, etc. However, such structures are not yet implemented in the Indonesian ecosystem.

In terms of attractiveness as an investment destination for EdTech companies, Indonesia lags far behind other countries in the region, such as China and India. Chinese EdTech firms in particular have raised large sums of capital in recent years. For example, in 2017 around half of all companies in that world that raised more than US$100 million in capital were in China (Adkins, 2018). By some estimates, China's EdTech sector is projected to grow by 20 percent annually over the next few years (Liu, 2018). Meanwhile, the Indian online education sector is expected to grow around eightfold, from US$247 million in 2016 to just under US$2 billion by 2021 (KPMG, 2017). While similar estimates are not available for Indonesia, all investors that were interviewed noted that Indonesia's EdTech sector is also poised to grow rapidly. One reason for rapid growth in China and India is that many EdTech firms had 'role-models' to try and emulate. For instance, the success of firms such as Byju, Vedantu and Toppr in India, and Yuanfudao and TutorGroup in China, has inspired other EdTech firms. Indonesia is yet to witness any unicorn[32] in the EdTech sector that could serve as an inspiration for new EdTech firms and potentially have the same catalytic effect across the sector. Nevertheless, there are a few EdTech companies whose trajectories have been notable in terms of user growth and investor attention over the past few years, such as Ruangguru, Harukaedu, Zenius, Cakap by Squline, Rencanamu (formerly, Youthmanual) and Danacita. According to a recent internal EdTech sector study conducted by an impact investor in Indonesia, there are only three EdTech players in Indonesia that have raised series A and above in VC funding. They also identified that more than 80 percent of the total private sector EdTech investment has going into funding the three most-funded EdTech startups in Indonesia.[33] Also, the Indonesian EdTech sector is witnessing more global players (such as Udemy, Kahoot, Brainly and Quipper) entering the market. Most global players entered Indonesia in the past three years and are primarily focusing on the K-12, massive open online courses (MOOCs), homework solutions and the LMS space.

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32   A unicorn is a privately held startup company valued at over US$1 billion.

33   Similar patterns can be seen in India, where 77 percent of the total EdTech funding is concentrated to only four startups between 2014 and 2018 (Byju's, Toppr, Unacademy and Vedantu) (Das, 2019).

6.1 Challenges investors identified as major hurdles

According to investors, there are many internal and external country-specific and sector-specific challenges facing the EdTech sector that impact their potential to scale up (see Box 4), including that Indonesia does not allow for-profit education service provision. This leads many EdTech firms to incorporate as software firms or other types of IT-service providers, rather than firms working in the education sector.

Box 4: Main challenges identified by EdTech investors in Indonesia	
Poor unit economics of current EdTech business models and low willingness to pay	The monetization potential of EdTech players in the mass market remains low in the short to medium term. The EdTech sector in Indonesia is yet to provide examples and cases of a critical mass of successful business models that generate sustainable revenue in the mass market. Furthermore, because of the novelty of the EdTech sector and the low levels of awareness, the sales cycles are very long and costly. Changing people's traditional behaviors and targeting users one-by-one (B2C business models) is very challenging. Consumer willingness to pay (especially from the perspective of parents) remains low. Many parents and caregivers generally do not tend to see the need to pay for additional education services. This serves to compound the problem of poor unit economics for EdTech companies.
Low digital literacy among teachers	The low level of digital literacy among teachers and inertia in adopting digital technology is one of the main obstacles to growth. This has created a lack of qualified teachers who are willing to embrace new digital technology.
Poor accessibility to relevant digital infrastructure	Poor accessibility to relevant digital infrastructure (particularly off the island of Java) inhibits the penetration and dissemination of EdTech products across Indonesia.
Government regulation	Government regulation adds another layer of complexity. Currently, the GoI prohibits for-profit education provision (Figure 25). This appears to be a challenge unique to Indonesia in the Southeast Asia region. Investors noted that this regulation also inhibits innovation in dissemination strategies of online education.

07

CHALLENGES AND OPPORTUNITIES FACING THE EDTECH SECTOR IN INDONESIA

The EdTech sector faces significant challenges that prevent it from replicating a similar level of success and growth as seen in other technology sectors. The challenges facing the EdTech sector can broadly be categorized into supply-side and demand-side challenges.

The supply-side challenges can be split into several sub-categories but there are three main challenges (Figure 25). The challenges can be classified loosely as cultural (resistance to change), consumer-related and business-related. As is evident, several of the challenges listed below—based on the information gathered from the EdTech companies—are similar to those identified by the EdTech investors listed in the previous section.

Figure 25:   Supply-side challenges

Acces to funding

Finding the right monetization model

Human Capital

Source: Various including interviews and surveys.

Unfavorable comparisons with other tech sectors create challenges for accessing funding in the EdTech sector. The EdTech sector often does not compare well with other tech sectors in Indonesia, such as e-commerce and FinTech, as it does not yet have a proven track record of financial success. More than 57 percent of the EdTech firms surveyed and interviewed for this study emphasized that access to external funding is one of the major challenges they face that limits them from achieving their outcomes, funding their operations, and scaling their outreach and impact. EdTech firms find it difficult to access funding and raise capital due to an apparent fundamental lack of understanding by Indonesian investors regarding how different the EdTech sector is from other tech-related sectors. To date, financing by VCs or angel investors from outside Indonesia to Indonesian EdTech firms is very small.

Mismatch in objectives between investors and EdTech firm founders can be measured along two dimensions: *time* and *profitability*. Most investors lump EdTech firms in the same basket as other tech-sector firms, which means that they are looking for high returns on their investments via exit strategies. The social impact intentions that underpin many EdTech firms' reasons for establishment are often at odds with VC and other private sector institutional investors. The difficulty in obtaining funding from traditional venture capitalists leads to many EdTech firms seeking funding from individual angel investors or private impact investors. As discussed above, the impact investment sector is still in the nascent stages in Indonesia and, although the EdTech sector is one of the sectors that is garnering increasing attention from impact investors, they still tend to invest in mid-to-growth stage companies with proven business models. This limits many early-to-mid stage EdTech companies to relying heavily on individual angel investors. However, relying only on individual angel investors limits the access to ongoing funding, because of the limited investment capacity. Furthermore, having too many individual investors on your capitalization table can also act as another

barrier to accessing VC funding, by making the investment less attractive. This lack of ongoing investment and the limited amount of angel capital relative to institutional investors often pose a challenge for scaling up the operations.

High operational costs act as a barrier to growth of the EdTech sector as a whole. High and recurrent operational costs were identified as a considerable burden for EdTech firms. The recurrent nature of the operational expenses means that variable costs are high for the vast majority of firms in the EdTech space. Many EdTech firms consider customer acquisition to be most challenging, as the sales cycles are particularly long. Targeting schools and other education institutions requires overcoming multiple challenges (a combination of first- and second-tier challenges) and often requires direct intervention leading to high human-resource requirements. High and variable customer acquisition costs are a significant ongoing challenge for EdTech firms. Low digital technology infrastructure and poor connectivity off Java also requires a physical presence to sell products and services to education providers and users. These costs stem from having to acquire customers in the education services provision sector using offline, labor-intensive methods, especially off Java. This adds to costs in an already capital-constrained environment where funding is difficult to acquire and retain. As noted earlier, the majority of EdTech firms were forced to change their business model from B2C to B2B2C. The primary reason for this change was that the B2C operating model was significantly more costly than the B2B2C model. EdTech firms noted that changing their business model from B2C to B2B2C allowed them to lower risks and focus more on the quality of the product or service, instead of acquiring and retaining end-users.

Figure 26: **Multiple business models**
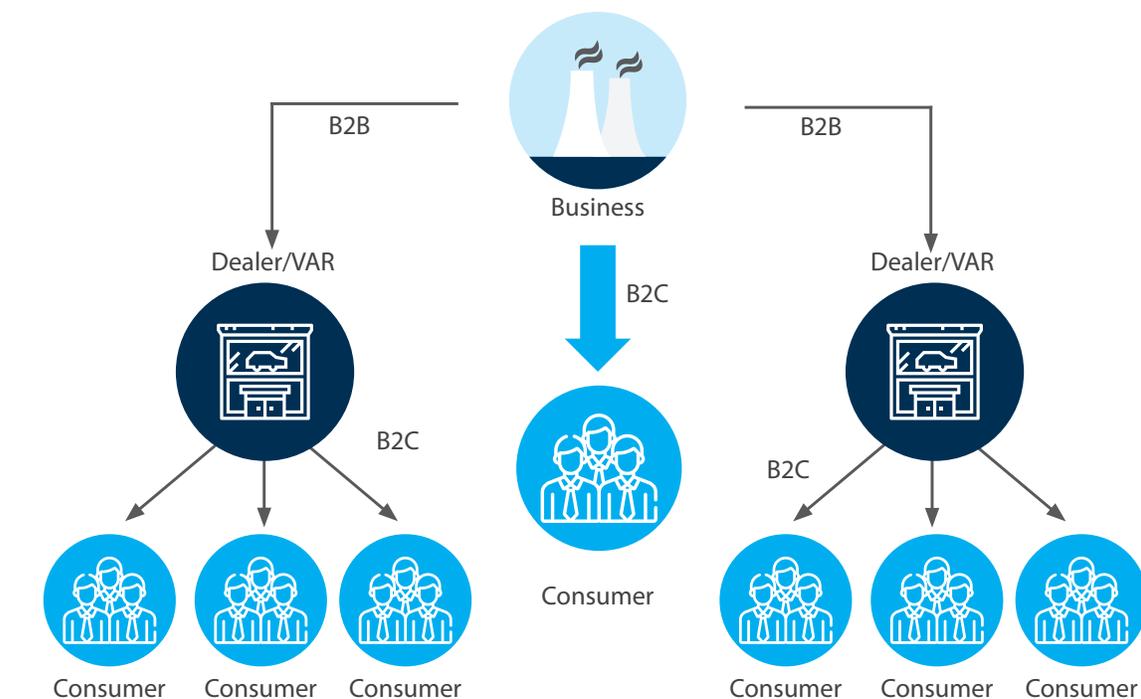
Source: next4biz (2019).

There is a significant shortage of well-qualified talent with the relevant skills required for roles in EdTech firms. This is a challenge that is pervasive throughout the Indonesian tech-sector and is linked to Indonesia's broader human capital gap (World Bank, 2019). The scarcity exists for talent with digital expertise, but also expertise in other subject areas such as mathematics and science. With regards to IT expertise, Indonesian universities are currently not producing an adequate number of graduates in total, or an adequate number of graduates who can readily transfer content learned in classrooms into a business environment. The lack of IT graduates is expected to leave Indonesia with a shortage of about 9 million skilled and semi-skilled workers in the IT field by 2030 (Balmaceda et al., 2019).

According to F2F interviews, less than 16 percent of the total computer science graduates produced by Indonesian universities are hired as developers. Moreover, the majority of EdTech firms currently do not have the financial capacity to compete for scarce talent against bigger players in the tech sector.[34] Large firms such as Go-Jek, Tokopedia, Bukalapak, Ovo and Traveloka have the capacity to pay significantly higher salaries than those typically offered in the EdTech sector. It is the lack of readily available technology talent that forces many technology firms in Indonesia to utilize talent in regional peers or set up their technology development offices offshore (India being the major source for recruitment and destination for setting up offshore offices).[35] Indonesia's strict restrictions on foreign human capital create a double layer of burden, which means that even if firms want to hire foreign workers it is difficult for them to do so, and anecdotal evidence indicates that they often resort to outsourcing. In addition to finding the right talent, many EdTech founders indicated that, although they come from the education sector and have the sectoral expertise, they themselves lacked the business knowledge to improve the unit economics and find a sustainable business model.

While the COVID-19 pandemic is adversely impacting most of the economy, the EdTech sector is benefitting from large increases in demand. Initial reluctance in adopting technology among some educational institutions, teachers and parents has been replaced by urgent necessity with large numbers of students now reliant on online and distance education. This means that the COVID-19 crisis could be an opportunity to accelerate the adoption of effective online learning methods and to encourage educational institutions to adopt remote learning methods to improve resilience for future crises. The crisis will also provide an opportunity for the EdTech sector to prove its worth in sustaining and improving student learning, and in supporting traditional educational institutions in the delivery of online education.

7.1 Demand-side challenges

There are four main demand-side challenges faced by the EdTech sector. The four main demand-side challenges are: (i) resistance to change; (ii) a low willingness to pay; (iii) a lack of digital literacy; and (iv) a lack of digital infrastructure and limited connectivity (Figure 27).

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34 Many of the EdTech firms surveyed and interviewed noted that big tech players such as Go-Jek, Tokopedia, Bukalapak, Ovo and Traveloka are their main competitors for IT talent.

35 We estimate that more than 70 percent of the technology team of Indonesian tech-giants such as Go-Jek, Tokopedia and Ovo is comprised of Indian talent.

Figure 27:   Demand-side challenges

Resistance to change

Customers low willingness to pay or lack of ability to pay

Low digital literacy

Limited and poor quality digital infrastructure

Source: Various including interviews and surveys.

The one common challenge highlighted by all EdTech firms was resistance to change. Inertia is common when technology is used to disrupt traditional practices, and the Indonesian EdTech sector is no exception to this. While there is a growing number of private education providers in Indonesia, these providers are still outnumbered by public schools. Demand for private education is expected to grow as the middle class becomes increasingly more affluent. This could be a catalyst for change in the acceptance of external support for learning, such as through EdTech products and services. Another major catalyst in other markets has been the introduction of online testing, which has driven investments in hardware, as well as connectivity. Computer-based testing is something Indonesia has expanded greatly in the past three years.[36] These two factors could support a growth trajectory similar to that seen in countries such as China and India. Evidence in Indonesia indicates that this process is underway with key stakeholders, such as the GoI, recently noting that the huge scale of Indonesia's education market meant that the next unicorn is likely to be an EdTech firm.[37] However, the scale of the challenge should not be underestimated.

Resistance to change comes mainly from two sources: education suppliers and parents. The rationale for classifying 'resistance to change' as a cultural challenge is that it stems primarily from education suppliers (such as schools, universities and teachers) and enablers (parents/guardians). Most of the firms interviewed and/or surveyed noted that a generational gap tends to exist between the suppliers (EdTech firms) and some populations of targeted users (teachers). This is not surprising given that over 50 percent of Indonesian civil servant teachers are expected to retire in the next decade (World Bank, 2018b). EdTech firms often noted that this age profile of teachers created a two-part challenge: resistance to change and a low level of digital literacy. This generates an additional problem for EdTech firms, most of which are not yet profit generating, as it added to the costs of selling their products and services. One interesting finding of the F2F interviews was that resistance to change was not only present in among K-12 education providers, but also apparent among tertiary education providers (see Box 5).

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36   https://unbk.kemdikbud.go.id/#tentang

37   https://www.reuters.com/article/us-indonesia-startups/indonesia-expects-to-have-more-than-5-unicorns-by-2019-minister-idUSKCN1G310J

Box 5: Resistance to change by consumers and providers

One large EdTech firm shared its experience in trying to make headway in Indonesia's higher-education sector and noted that breaking down resistance to change could take several years. Its product and service offering included a mix of course content for students, as well as online learning systems for education providers. In its case, the firm had tried to create partnerships with over 300 universities over the past four years. During that period, they established only 10 meaningful partnerships. The main reason for not establishing more partnerships was universities not being open to changing well-established course delivery methods. Other reasons included not having the appropriate human capital to sustain EdTech innovations without ongoing support from the EdTech firm, which was costly to provide and not part of the firm's original business model.

The resistance from parents stems from a perception that, at best, digital technology is considered to be an inadequate supplement to traditional education supply via physical classrooms and, more often than not, a distraction. At least until the tertiary education level, parents typically provide permission/guidance and funding for educational pursuits. EdTech firms report that the prevalent parental perception (which, similar to teachers, is linked to a generational gap) is that digital technology is not an adequate and/or appropriate supplement for traditional education. This is often combined with a lack of understanding about what educational technology actually entails and how it can benefit students. This means that EdTech firms are faced with a significant hurdle that they have not yet been able to overcome. One potential solution to overcome this challenge (and a solution that EdTech firms are increasingly utilizing) is for EdTech firms to systematically monitor and evaluate the impact that their products and services have on student learning (via, for example, collection of data that looks at test scores, university enrolment acceptance rates, etc.) and then use this information to persuade parents of the value-add of their products and services. Indeed, international evidence supports parental and educator skepticism about the effectiveness of EdTech (e.g., JPAL 2019).

Low willingness and/or lack of ability to pay for EdTech products and services is a major challenge for the vast majority of EdTech firms. Only a handful of Indonesian EdTech firms are profitable. Users (both educators and students) tend to actively use products and services that are free. Parents are more amendable to digital technology for education if costs are borne by schools and universities, as it gives the product/service a sense of legitimacy from their perspective.[38] Many EdTech firms have tried—albeit unsuccessfully so far—to change user behavior and to change their willingness to pay by offering free trial periods. However, less than 5 percent of users convert to paid users once free trial periods expire. While it could be argued that willingness to pay also relies on a certain level of accuracy with regards to price discovery, it is hard to completely disentangle the factors that hinder customers' willingness to pay, given that there are cultural reasons that could play a disruptive role too. For example, firms may choose a price that people are willing to pay, but will not do so because they are not interested in educational products and services. Given that firms do not systematically interact with those who do not use or purchase their products, it is sometimes hard for them to accurately price their product/service because they do not know if people are not purchasing due to price or other reasons, such as quality. The lack of data (even among

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38 Recall that EdTech firms noted that most parents they encountered viewed education as a right and one that should be provided by the government. As such, using digital technology is considered by them to part of the education package that their children receive.

EdTech firms) means that it is difficult to distinguish between users being *unwilling* and *unable* to pay.[39] Payment modality and frequency further compounds the challenge of users being unwilling or unable to pay. EdTech firms noted that most users (or those that have to pay for products and services, such as parents/guardians or institutions) balk at paying upfront costs, which led them to offer higher frequency subscriptions. However, smaller and higher frequency payments did not necessarily result in an increase in paid users. Finally, many EdTech firms pointed out that it is difficult to monetize products and services when customers' valuation of those products and services was quite low (see Box 6).

Box 6: High discount rates

Several EdTech firms noted that changing the mindset of customers, in particular parents and caregivers, to pay for digital products and services was a major challenge. Interestingly, several of the EdTech firms noted that their internal market research indicated that that customers were more willing to pay for a consumer items that provide instant gratification, such as smartphone, than they were to pay for EdTech products or services,[40] which provide potential gratification much later into the future. While many customers indicated that they were willing to take out a loan to purchase a smartphone, they also indicated that they were not willing to take out a loan for education. Customers noted that they were able to benefit immediately from the purchase of a smartphone, while the benefits of paying for educational products and services were much harder to quantify in the long term. Many customers also did not disentangle the costs of physical products versus digital products (such as software). Digital products were considered to be part of purchasing a physical product (such as a smartphone, tablet or laptop). The only exception to this was the purchasing of connectivity. Customers distinguished between paying for connectivity and paying for other products and services.

Source: F2F interviews and surveys.

Digital illiteracy poses a challenge for EdTech firms, particularly when attempting to market their product or service to education providers. More than 80 percent of EdTech firms surveyed/interviewed indicated that only a basic level of digital literacy was required to use their product or service. However, the challenge with digital literacy was perceived by the firms to link to education providers' inability to understand how to use the products, combined with a perception that anything digital-related is complex to use (and, indeed, it may be in their experience). As a result, firms felt that education providers displayed inertia in adopting and using EdTech products, and did not value them or use them as teaching aids or for administration purposes. A secondary challenge with digital illiteracy from participating EdTech firms' perspective was that many education providers were unable to keep up with the rapid pace of digital innovation. As a consequence, this added to the general low willingness to pay, and the perception that learning technology and adopting digital solutions needed more effort than the existing approaches.

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39 It is important to note the distinction between users that are unwilling vs users that are unable to pay for the products. The unwillingness to pay for the product may arise due to bad design and user experience, or it may be because the users do not understand the benefits of using the product. Therefore, from a business perspective, the unwilling users would require mindset/ behavioral changes that could be achieved by changing the marketing strategy and clearly communicating the benefits of using the products. Product quality and complexity (including bad user interface and users experience) may also play an important role in converting the unwilling users. However, the users who are unable to pay would require additional financial support to be able to pay for the products. Many EdTech companies noted that this can be either tackled by partnering with education-loan providers (peer-to-peer lenders) or government support in providing additional budget to students/schools/ universities to access EdTech products.

40 Remarkably, five EdTech firms used the exact same example about consumers willing to pay for a smartphone rather than education related services.

Despite having an internet penetration ratio of 50 percent, good quality digital infrastructure remains a major challenge in Indonesia. In absolute numbers, Indonesia has one of the largest numbers of users with internet connections. However, Indonesia's internet penetration is 56 percent, below the Southeast Asia average of 63 percent, and in line with the global average of 57 percent (We Are Social, 2019). Social media use grew 13 percent year-on-year in 2019 compared with 2018, adding 17.3 million new users, more than all but three other countries (We Are Social, 2019). Despite having these impressive numbers, the *quality* of connections—as measured by download speed—is poor (Figure 28). Also, unlike mobile broadband, fixed broadband penetration is low in Indonesia, which may constrain the ability of individuals to use EdTech products (Figure 29). Many EdTech companies that were interviewed indicated the importance of a stable internet connection and good digital infrastructure for providing complete features and disseminating their products across Indonesia. Many EdTech companies such as Ruangguru (online learning), Zenius (online learning), Endless Computers (education hardware and operating system) and Sikad (LMS) have found alternative solutions to tackle the digital connectivity challenge by offering pre-downloaded solutions that do not require internet to access study material or software features.

Figure 28: Digital infrastructure quality is poor in Indonesia

Average MBPS for fixed internet connections   *Average MBPS for mobile internet connections*
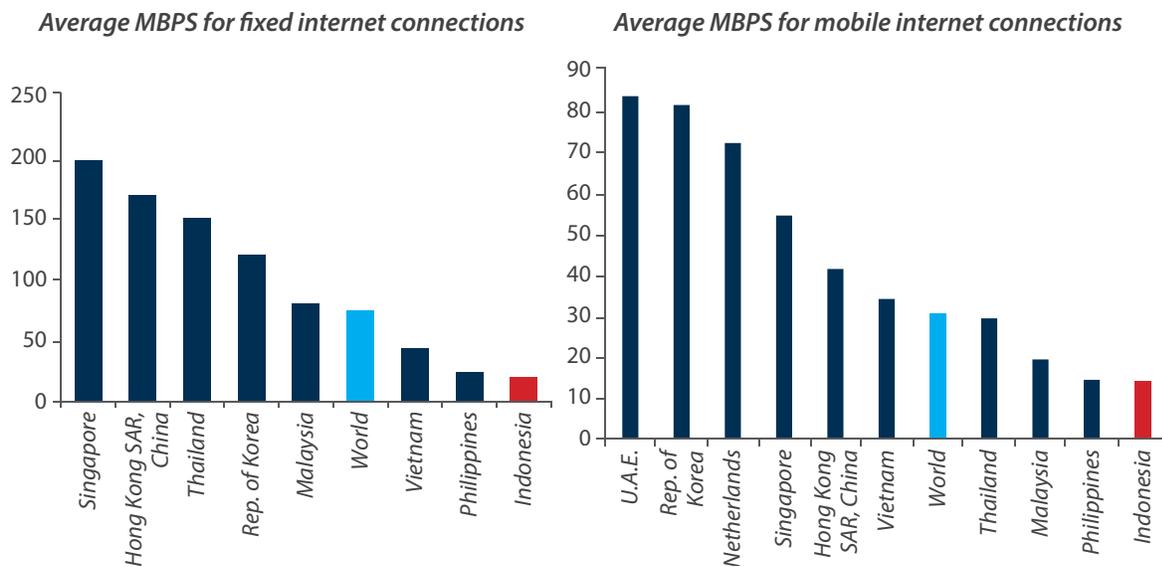
Source: Data from Speedtest by Ookla (2020).
Note: LHS panel is average Megabyte per second (MBPS) for fixed Internet connections and RHS panel is average MBPS for mobile internet connections. Both the figures contain the three top-ranked countries followed by a selected sample of Asian countries.

Figure 29: Indonesia lags behind in fixed broadband connection

Fixed broadband subscriptions per 1,000 people vs. GNI per capita (2018)
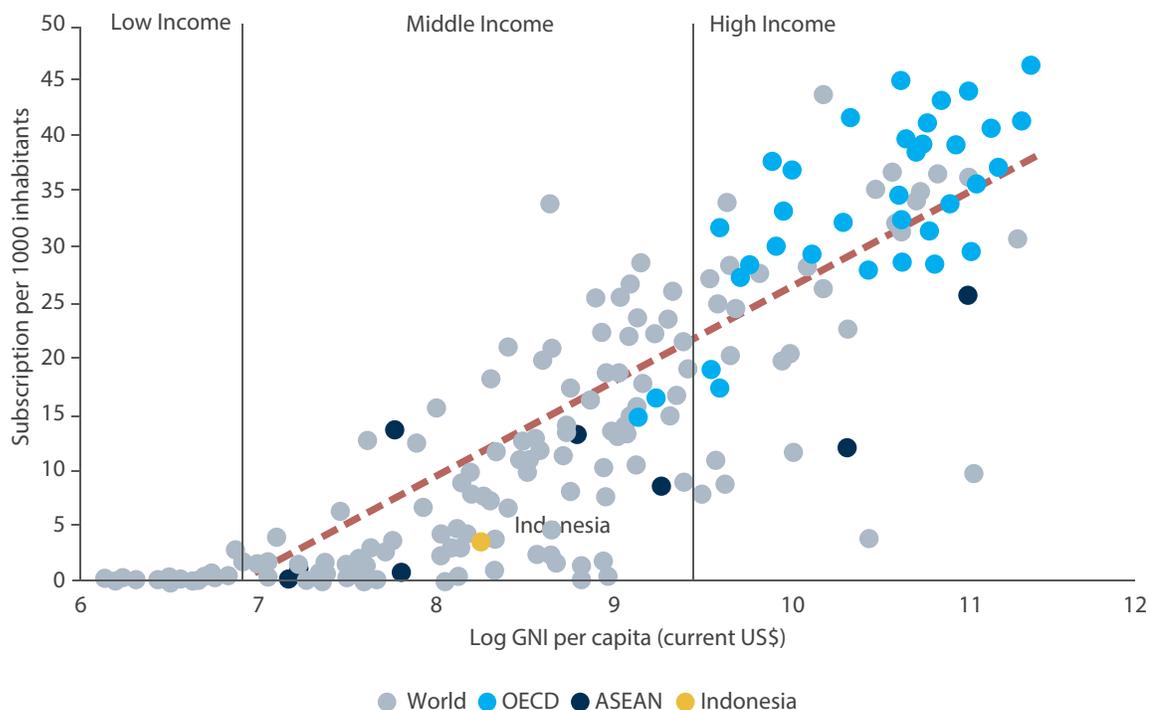
Source: World Bank (2018b).

7.2 Regulatory challenges

The current regulatory framework places institutions in charge of the EdTech sector that have limited capacity and incentives to unleash the potential of private investments in the sector. The MoEC itself receives annual budget allocations to improve the infrastructure enabling environment, financing multiple initiatives in the past, such as Jardiknas and SchoolNet,[41] in order to meet the Universal Service Obligation for Schools (2015), which mandates support for connecting all schools to the internet. However, the lack of clarity on governance roles and objectives appears to hinder the expansion of the private EdTech sector, since there are low levels of government support in terms of both funding and accountability. Current regulations place the MoEC and the MoRTHE as largely responsible for the oversight in the use of ICT in education, but it is not clear that either has the capacity or sees its purpose to assess the dynamic mix of effectiveness of private products on offer. Part of the MoEC's mandate (Pustekkom) is to develop content and deliver EdTech resources itself, making it in fact a potential competitor with private sector initiatives.

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41 Jardiknas was a national connectivity initiative to provide internet access to an ICT center at each district office with additional schools near that office connected via wireless networks. SchoolNet is a later, related initiative to provide fixed broadband connections available to schools free of charge from a specific provider (PT Telekom).

While the GoI has signaled some interest in partnering with the private sector to adopt EdTech products, such partnerships have by and large failed to materialize. Several firms noted that there appears to be significant enthusiasm in the MoEC for incorporating EdTech products and services into the Indonesian education system. However, field work for this report in 2019 suggested that several joint private EdTech-MoEC initiatives could not be developed because of the lack of local government support. That support is crucial in an education system with decentralized decision-making, as in Indonesia. The opposite scenario, where buy-in from local governments did not necessarily translate into buy-in from the relevant central government authorities, was also common. This points to the limited ability of private firms to navigate Indonesia's education system. This also points to the lack of information and incentives on the part of different levels of government on how to effectively negotiate with and assess the cost-effectiveness of EdTech products.

Part of the problem is that the overall role of the central government in relation to the private EdTech sector lacks clarity. Is the central government supposed to encourage growth of effective approaches and exclude ineffective ones, to compete with the private sector, or is it supposed to foster growth of the sector and see what works? Without a clear vision and definition of the GoI's role combined with the capacity to fulfill it, the regulatory environment remains ambiguous and may hinder rather than encourage the development of a high-quality, equitable and low-cost EdTech ecosystem for Indonesia's students and teachers.

In addition to supporting the enabling environment through investments in human capital and infrastructure, government policy should also play a basic consumer protection role, which is currently underdeveloped in Indonesia. This should include establishing clear standards on data security, use and privacy for the sector to ensure that EdTech users, and especially students, are protected. This could be across sectors through the Ministry of Communication and Information Technology (MCIT), or sector specific through the MoRTHE and the MoEC. Draft data protection legislation has been under consideration for several years to strengthen and consolidate different pieces of legislation, including Law No. 19/2016 on Electronic Information and Transactions and MCIT Regulation No. 20/2016. Indonesia is considering setting up an independent agency to supervise the application of a new personal data protection law (*The Jakarta Post*, May 23, 2019). More discussion of the proposed policy, including input from EdTech firms and international experience, would be helpful.

Box 7: Chile's EdTech marketplace

Chile's EdTech marketplace facilitates EdTech procurement through an online platform managed by the central government, where schools can directly choose and purchase from approved suppliers. When EdTech companies achieve large sales and have consistent revenue streams, it is more likely they will have funds to invest in further content development for smaller markets (Omidyar Network 2019 "Scaling Access").

Indonesia already has a similar platform, eKatalog, but the process of listing EdTech products on this procurement platform was less than transparent to many firms interviewed for this study. They reported that the allowable software programs on the platform and compatibility requirements for EdTech products are not clearly established or consistent with a diverse marketplace.

Beyond consumer protection, successful policy frameworks and interventions in the sector from other countries promote equitable EdTech, where poor and disadvantaged students gain equal or preferential access to technologies proven to be effective. The policy frameworks should filter out low-quality, ineffective EdTech products from the public sector market, and support the adaptation of proven, cost-effective models by schools and education personnel through teacher and administrator training and other mechanisms. One way of doing this is by providing information on the effectiveness and cost of different products to schools to help them make decisions about potential investments. Some of these roles can be played by government, by civil society groups, academic institutions or consortia of these actors, depending on capacity and sometimes in partnership with the private sector.

Box 8: China's EdTech rise

China's EdTech market is the largest in the world by number of customers and is primarily B2C; how did it get there?

(i)   There is strong demand from parents and students, most often linked to test preparation.

(ii) There is a clear vision for EdTech integration set by the government, including investments in school connectivity, focused on equitable expansion of infrastructure and internet access.

(iii) Investments in teacher capacity, for example requiring all teachers to complete an education technology standards course, which covers content evaluation, as well as data privacy and security.

(iv) A regulatory system that establishes clear market rules. For example, online providers must acquire licenses before releasing them to the public.

These elements have combined to help develop a large and robust EdTech market in China with products that are seen as effective in improving student learning outcomes and teacher practices by large numbers of consumers.

1 Market Demand and Willingness to Pay
To support continuous improvement and innovation there needs to be interest and continuous demand from the users and educators.

2 Policy Vision
There needs to be policy plans put in place to support the use of EdTech in educational institutions and encourage usage by students, teachers and parents.

3 Investment in Digital Infrastructure and Human Capacity
Strong policy vision will encourage investment by Govt and private sector in digital infrastructure and educator training to achieve the policy vision.

4 Clear and Stable Regulation
Stable and supportive regulatory environment encourages innovation to ensure equitable distribution of products and consistent supply of EdTech products.

5 Effective and high quality Supply
Public-private sector partnership is needed to support the access and impact of the EdTech products. For this businesses need to come up with cost-effective methods of marketing which can be B2B, B2C, B2BC or B2O.

Source: Adapted from 'Scaling Access and Impact' 2019 Omidyar Network China Country Report.

7.3 Impacts of the coronavirus crisis: An opportunity for some

The COVID-19 pandemic is negatively affecting most economic sectors, while the EdTech and HealthTech sectors are experiencing some positive impacts. The reluctance to adopt technology among some educational institutions, teachers and parents has been turned around by the crisis, as many are now reliant on online and distance education for student learning. We expect the COVID-19 crisis to accelerate the adoption of online learning methods for disseminating education and to encourage educational institutions to adopt remote learning methods to improve resilience in future crises. The rapid nature of school closures in Indonesia meant that much of the move to distance learning was unplanned, and the challenges and shortcomings of the sector have been on display for parents and teachers, as well as students. The need to be able to sustain and improve student learning will provide a high-opportunity arena for EdTech players to prove their worth and support traditional educational institutions in the delivery of online education.

COVID-19 Impact on EdTech Demand and Supply

Social distancing and school closures have driven increased interest in online programs offered by education providers globally. With more than 68 million students across the country unable to attend school, EdTech companies are introducing new programs to help more students continue their education. The MoEC coordinated with EdTech players such as Zenius, Quipper School and Ruangguru to offer free programs and services, such as live teaching channels, question banks, online practices exams, instruction videos, etc., to help students continue their education from home.[42] These and other platforms are also offering services for teachers and parents to help manage the online learning transition. For instance, Ruangguru is offering an online teacher training program to help educators improve their teaching skills, such as managing classrooms and implementing project-based learning for when schools finally re-open.[43] With an increasing number of students and education stakeholders converting to EdTech platforms and online tools, it is expected that, in the longer term, there will be a permanent behavioral change. This forced adoption during the crisis is expected to act as a catalyst for people to embrace EdTech and support longer-term sector growth.

The increase in demand for online learning has also driven massive growth in the user-base of leading EdTech platforms in Indonesia. Based on telephone interviews, including with one of the leading VCs in Indonesia,[44] EdTech platforms have seen more than 200 percent growth in the number of their active users and the number of applications downloaded in the month of March 2020. With demand increasing, the two most popular EdTech products at this time are the platforms that offer learning management systems (LMS) for teacher-student collaboration and online teaching management, and the platforms that offer interactive classroom tools for hosting interactive live teaching sessions, such as G-Suite for Education, Microsoft for Education, Zoom, etc.

The GoI is encouraging the use of online learning. The MoEC has launched a co-sharing platform "Guru Berbagi" to support teachers practice online and remote learning methods by encouraging practitioners

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42 https://www.thejakartapost.com/youth/2020/03/16/studying-from-home-seven-online-learning-platforms-for-students.html

43 https://kr-asia.com/edtech-platforms-step-up-while-indonesia-shuts-downs-schools-in-major-cities

44 Identity concealed on request.

and education stakeholders to share learning implementation plans. The platform will also serve as a space for teachers to share and learn from the experiences, and create online learning strategies adopted by their peers.[45]

EdTech is not accessible to all learners, and Indonesia's education system is not well equipped to offer online learning for students at scale, quickly. Many students in rural areas lack connectivity, and many lower-income students lack access to devices to use EdTech tools. This contrasts with lower-tech options such as television: 95 percent of students accessed TV in the prior week (96.6 percent in urban and 92.3 percent in rural areas) according to data from Susenas 2018.[46] To help address these equity issues for access, the MoEC launched educational television programming Belajar dari Rumah (Study from Home)[47] on TVRI[48] on April 13, 2020. The programming has different blocks aimed at early childhood elementary school, and junior high and senior high school students.

Data show that searches for 'Study from Home' and related search keywords, such as 'Rumah Belajar', 'Belajar dari Rumah', 'belajar di tvri' showed a spike in demand around the time schools closed in Indonesia. The significant increase in the study from home related keywords from Google Trends provide an indication of the increased demand for online and remote education.

Figure 30: **Six-month Google Trends report for keywords "Rumah Belajar"**
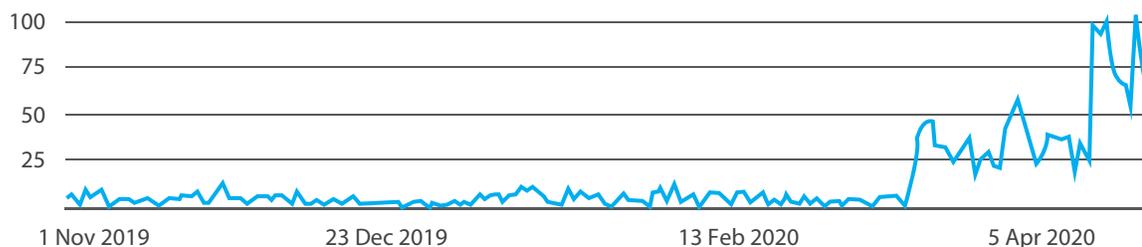
Figure 31: **Six-month Google Trends report for keywords "Belajar dari Rumah"**

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45   https://tirto.id/guru-berbagi-program-kemendikbud-untuk-belajar-daring-eK79
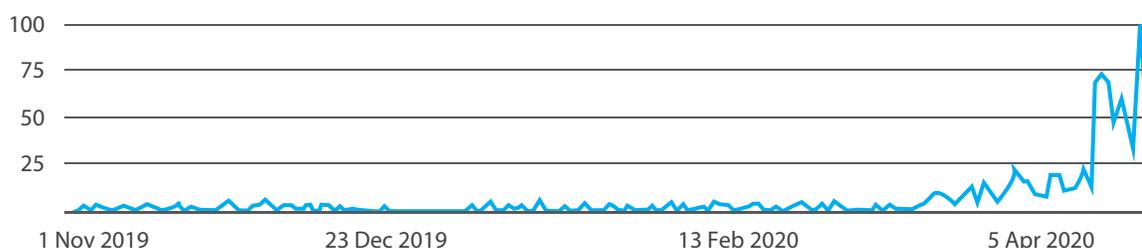
46   http://anggunpaud.kemdikbud.go.id/images/upload/images/peraturan_pp/Statistik%20Penunjang%20Pendidikan%202018.pdf

47   https://www.thejakartapost.com/news/2020/04/10/covid-19-tvri-to-air-educational-program-to-help-students-learn-from-home.html

48   TVRI or *Televisi Republic Indonesia* is a state-owned, public broadcasting television network in Indonesia.

Figure 32:   Six-month Google Trends report for keywords "belajar di tvri"

Source: trends.google.com

Another indicator in the surge in demand for online learning is the sharp increase in website traffic and application downloads for leading EdTech platforms since February 2020. The web traffic report for some of the players can be seen in Figure 33.

Figure 33:   Web traffic overview for some EdTech platforms

A: zenius.net
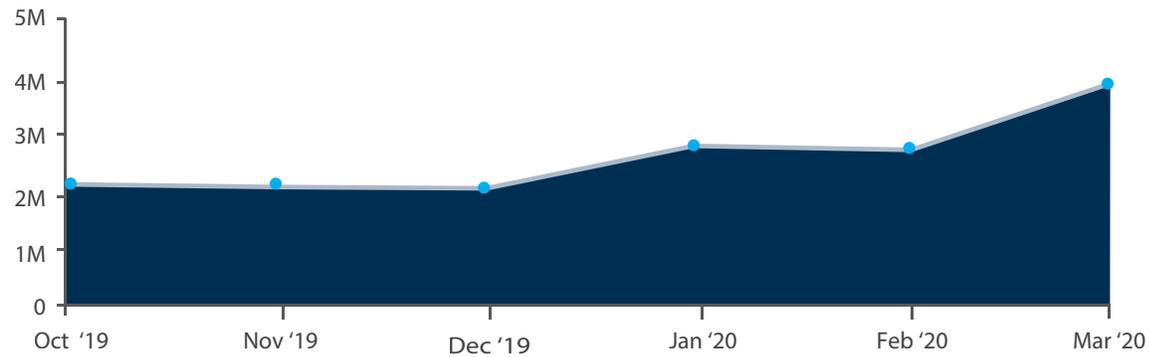
B: ruangguru.com
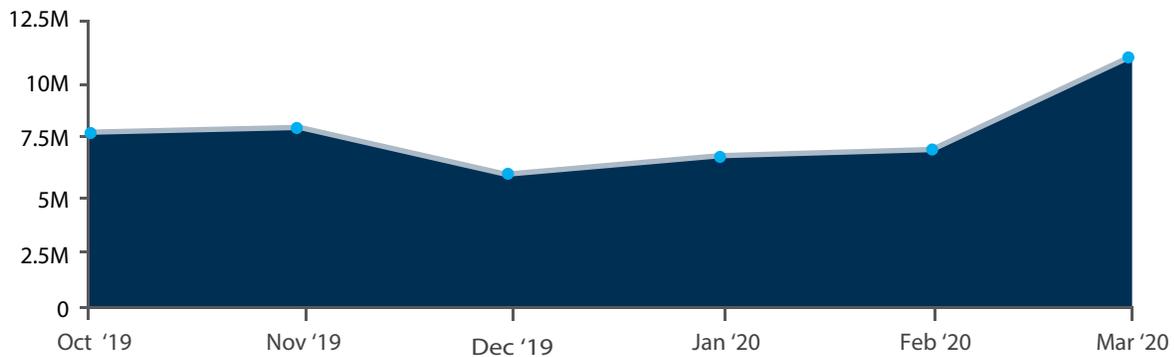
C: quipper.com
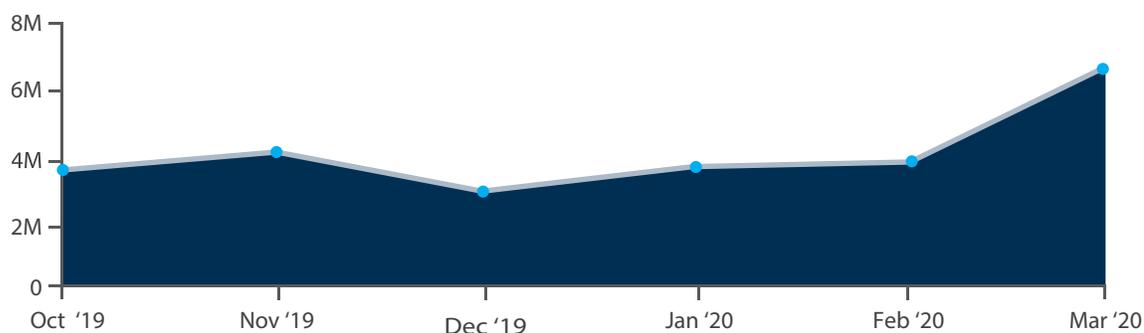
Source: similarweb.com

COVID-19 impact on EdTech sector funding

With Ruangguru raising US$150 million[49] in funding at the end of 2019 and Zenius raising US$20 million in funding at the beginning of 2020,[50] the pre-COVID-19 era had seen strong capital flows into the Indonesian EdTech sector. The post-COVID-19 deal flow across sectors has slowed significantly, including in EdTech. Nonetheless, there has been significant activity in terms of dialogue between investors and Indonesian EdTech startups. These investors are actively targeting the EdTech space for investment, especially because the EdTech sector is likely to be one of the sectors that will emerge from the pandemic with a better outlook for its future than before.[51]

The closing of schools is providing a boost to the online-learning market as a whole by increasing demand and as a result the number of EdTech users. What is less clear is how many of these users will remain once schools re-open, and how many of them will pay for EdTech services, many of which are currently free or discounted. Although the medium and long-term impacts on the sector as a whole in Indonesia are unclear, many practitioners expect that the pandemic will result in an overall behavioral shift and long-term adoption of online learning. Anecdotal evidence indicates EdTech firms that are still in the development phase are more likely to suffer from lack of access to financing and thus unable to capitalize on the forced expansion of the overall user base. It isn't clear if these early-stage firms will benefit from an uptick in interest from different financial sources once the crisis is over, and then successfully enter an expanded market, or if this event will force a premature contraction of Indonesian EdTech start-ups due to capital starvation, and enable the larger firms to consolidate their market-share in a way that will hinder the entry of new players in the future.

49   https://news.crunchbase.com/news/indonesian-edtech-startup-ruangguru-raises-150m/
50   https://www.techinasia.com/zenius-bags-20m-appoints-ceo
51   https://www.ft.com/content/879ba44b-fa16-4a9d-afa4-f7f4e149edec

08

RECOMMENDATIONS AND POLICY OPTIONS

This section provides potential options to address some of the main challenges to the development of the EdTech sector identified in the previous sections. Six options are as listed below and then discussed in further detail:

1. Set standards for data privacy and security.
2. Measure EdTech products for impact and cost effectiveness.
3. Continue to invest to improve digital infrastructure and connectivity.
4. Support the development of EdTech startups with startup assistance organizations (SAOs).
5. Support the engagement of the private sector with interested public schools and vice-versa.
6. Use EdTech products as a bridge to education for the economy of the future.

8.1   Set standards and ensure data security

The GoI should ensure clear and consistent regulations across government to improve data security, data use and data privacy for the education sector. Currently, the MoIT, the MoEC and the MoRTHE's successor agency, the Ministry of Research and Technology, among other ministries, are involved in regulating the sector. However, the regulations on what student data can be collected, how they can be used, and how they must be safeguarded are not at all clear or consistent across the various authorities. Security is a particular concern—cyber-security breaches are common in Indonesia, with 12,895,554 attacks logged in 2018 by Indonesia's National Cyber and Encryption Agency (BSSN), with a major breach at the Lion Air Group exposing the data of 35 million customers.[52]

Clarity and coordination are needed to ensure EdTech users, and especially students, are protected against possible inappropriate use of their private data. This has been a major issue in other markets, particularly in the United States, and has contributed to a backlash against EdTech in some school districts. A first step would be to have the relevant regulators and the key entrepreneurs create a regulatory road-map for appropriate regulation that addresses issues of data use and security before the industry grows much larger. Sources for well-informed regulation include Consortium for School Networking (CoSN), among others.

8.2   Measure the impact and cost-effectiveness of EdTech products

If the EdTech industry is to grow and gain the trust of the potential users, it needs to measure the impact of its products on teacher practices and student learning outcomes. Only a very small percentage of firms (less than 10 percent) included in this study were able to produce any evidence of impact. The majority of firms did not have any plans to independently evaluate the effectiveness of their products in the near future. While rigorous and independent evaluations require time and money, the current lack of evidence of effectiveness means that parents, teachers, school administrators and students are asked to purchase and use EdTech products based only on advertising and marketing from the firm, and reviews provided by other users.

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52   https://bssn.go.id/wp-content/uploads/2019/02/Laporan-Tahunan-Honeynet-Project-BSSN_IHP-2018.pdf

> **Box 9:** **Two examples of assessing EdTech efficacy**
>
> Using the MindSpark product, which individually customizes educational content to match the level and rate of progress of each student in India, a randomized evaluation found increases in test scores of 0.36 of a standard deviation in math and 0.22 of a standard deviation in Hindi over just a 4.5-month period. While the absolute test score gains for all students were similar, the relative gain for weaker students was greater, positively impacting equity. The evaluation found the program to be highly cost effective, both in terms of productivity per dollar and unit of time. The results suggest that well-designed technology-aided instruction programs can sharply improve productivity in delivering education (K. Muralidharan et al., NBER, 2017).
>
> An implementation study of Khan Academy in the United States found: (i) the amount of time students spent working on Khan Academy varied considerably across and within sites, and also by school year; (ii) teacher perception of Khan Academy's impact on students varied across different learning areas and teachers; (iii) students who spent more time on Khan Academy work and successfully completed problem sets experienced more better-than-expected outcomes in terms of math test scores and reduced math anxiety, and had higher confidence in their ability to do math; (iv) lack of alignment of Khan Academy content with core curriculum posed a significant challenge for integrating Khan Academy into the classroom; and (v) in response to feedback from the educators at the study sites, Khan Academy implemented a wide array of changes, adding or adapting features to facilitate the product's use in the classroom (R. Murphy et al., 2014).

The EdTech community, including EdTech firms, NGOs, academia and government, should work together to establish clear, functional standards for performance against which products can be transparently rated and compared. This same group of actors, including philanthropic capital, should invest in transparently and rigorously evaluating some of the current leading products. The longer-term goal of this standard-setting, investment and evaluation process is to create a suite of options for consumers that are cost-effective in generating learning outcomes, and allow potential consumers to make informed choices about how much to pay for specified student-learning-outcome improvements.

8.3   Digital infrastructure and connectivity

Indonesia's digital infrastructure and connectivity need to be upgraded. In some instances, digital infrastructure is not only underdeveloped, but completely unavailable (Tapsell and Jurriens, 2017). One potential solution to address poor digital infrastructure and limited connectivity would be for the GoI to expand its current efforts to include a broader range of partners, including those from the private sector, to provide internet access in underdeveloped areas and for underserved communities. This solution could also be applied on the island of Java itself, where connectivity and quality of digital infrastructure are uneven, despite being stronger on average than in other locations.

Recent regulatory changes to the *Bantuan Operasional Sekolah* (BOS) system now allow schools to pay directly for internet access, while additional flexibility has been added as part of MoEC's COVID-19 crisis response. While the effect this will have on school connectivity and data speeds is unknown, since these data are not tracked centrally, the termination of school connectivity programs such as Jardiknas (an internet connection provided by the MoEC through Telkom since 2006, but reduced significantly after 2015: the connection has with max speed of 32 or 64 Kbps [4KBps or 8 KBps in real terms]) means that remote and

rural schools may have limited or no options to connect to the internet, making equitable access to EdTech tools more difficult.

The closing of schools as part of the COVID-19 crisis response has revealed the inequities in access to online learning, which are likely to be an issue in future crises as well. Investments in digital infrastructure and connectivity for universities, schools, teachers and students will increase the resilience of the education system to external shocks from climate change, natural disasters, pandemics and other events.

8.4 Support the development of EdTech startups

One way to support and nurture startups in the EdTech sector is to support the development of sector-specific startup assistance organizations (SAOs). These organizations can create specifically curated programs for the EdTech sector to bring together government, civil-society and the private sector, and provide EdTech founders with access to networks of experienced mentors, business support, and access to investor networks. Many EdTech founders indicated that, although they come from the education sector and have sectoral expertise, they lacked the business knowledge to improve the unit economics and find a sustainable business model. SAOs of various models play an important role in developing and strengthening the startup ecosystems around the world (Bhardwaj and Ruslim, 2018). A similar role is sometimes played by established VC firms (e.g., Sequoia and Convergence), where they assist startups in their portfolio to access mentors and expert advice. Well-developed ecosystems can have a catalytic impact and have proven instrumental in bringing about rapid policy level changes, as can be seen from the FinTech sector's growth in Indonesia. *Currently, Indonesia does not have any SAOs that specifically cater to the EdTech sector.* Fostering growth of sector-specific SAOs could provide an avenue for supporting and guiding EdTech firms and giving them with tailored assistance.

8.5 Support engagement of the private sector with interested public schools and vice-versa

Both the public and private sectors need to engage with each other more effectively:

(1) **Private firms need to better understand the needs of teachers, schools and parents**. Our survey suggests that private firms often do not understand how to work well with teachers, schools, parents and higher levels of education governance. This limits their ability to work effectively with Indonesia's education system, as many successful EdTech models include teachers as the focal point in the learning process and seek to augment or supplement their work. Technologies that complement the work of teachers tend to work better than technologies that try to substitute for teachers (WDR 2018). Successful EdTech firms such as China's 17EdTech often employ local representatives who spend time working with teachers to build their understanding and ability to use the product effectively. This additional cost may be a required part of the business model in an environment where teachers lack high levels of digital competency and limited incentives to master new teaching tools.

(2) **The public sector also needs to become more effective at engaging with the private sector, clarifying the EdTech governance structure and promoting PPPs for product development**. The

decentralized governance structure for public education adds to the transaction costs for EdTech startup firms, which are often small and unclear about the different regulatory responsibilities and authority. Enhanced coordination of the public education system across the different layers of bureaucracy could facilitate the engagement with private firms. For example, interested provinces and districts could be allowed to engage with private sector providers to test different products to improve learning outcomes. This would supply a willing and informed testing ground for EdTech firms, and allow willing and interested schools access to new technologies. According to interviews conducted for this study, some EdTech firms report that subnational governments fear partnering with firms due to unclear regulations and a lack of understanding about what they are allowed to do under the existing regulations. While the relevant ministries can be clearer and more consistent in their regulations, firms may also need to invest in educating potential partners about the existing regulatory framework.

A relevant international example is the *League of Innovative Schools*, a network of 102 districts in 33 U.S. states that aims to improve outcomes for students in public K-12 schools founded by the quasi-governmental *Digital Promise*. The League supports the learning technology market by: (i) creating rapid testing for new learning technologies; (ii) creating a buyers' consortium to buy inputs for testing materials at lower price and higher quality; and (iii) "advance market commitment" by the consortium of schools to encourage the private sector to create innovations. Other mechanisms could include transparent procurement processes for EdTech products and IT infrastructure following the example of Chile's EdTech marketplace (see Box 7). PPPs for product development are another possible mechanism, whereby interested schools can identify a specific challenge, or set of challenges, they are trying to solve, and work with private firms to develop and test possible solutions.

8.6 EdTech can be a bridge to education for the economy of the future, but support and planning are required

Plan for success. There is no clear roadmap in the publicly released drafts of the RPJMN 2020–2024 for integrating EdTech into Indonesia's education system.[53] Other countries with more developed EdTech ecosystems have a clear vision and strategy for integrating EdTech, which can make the often private-sector led expansion more equitable.[54] These plans can mandate, for example, the inclusion of EdTech services and devices that are usable by students and teachers with disabilities, and that implementation in the public sector preferentially targets lower-performing districts and provinces. While the changing world of work and education may be challenging for middle-income countries such as Indonesia to navigate, the next industrial revolution is already underway. Lack of a clear, detailed and implementable plan will not insulate Indonesia from the effects of the fourth industrial revolution, rather it will likely make the distribution of the potential gains from EdTech less equitable.

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53   Online learning and ICT is mentioned on page 112, but who will do what to achieve which specific goals is not clear https://www.bappenas.go.id/files/rpjmn/Narasi%20RPJMN%20IV%202020-2024_Revisi%2014%20Agustus%202019.pdf

54   China's current 10-year plan calls for 10-Mb broadband in all rural schools and 100-Mb broadband in all urban schools; the U.S. National Education Technology Plan was first published in 1996, and is updated every year to provide strategic guidance to state governments and school districts (Omidyar China and U.S. Country Reports, 2019).

The education system could partner with EdTech firms to improve teachers' ability to deliver technology-focused content. Integrating proven, cost-effective EdTech solutions into Indonesian classrooms can be part of a broader push to improve the employability of school-leavers and position tertiary-bound students for a broad range of technology-intensive careers. These efforts need to be supported with investments in teachers' ability to deliver technology-focused content, and should remain flexible and adaptive.

An effective partnership with EdTech firms could help public education to update the content of the national curriculum in technology-related topics and beyond. Demand for skilled candidates and returns to education in Indonesia remain high, and the skill sets requested by employers include digital and technology related abilities, which the education system is not supplying in sufficient numbers (World Bank, 2018d, discussions with interviewees). Many education systems continue to teach programming languages and use technology that is severely outdated, and no longer relevant to the marketplace. EdTech products have the potential to help upgrade the curriculum on these topics, but can also potentially support other topics, such as science, math, critical-thinking, and creative and communication abilities, which are essential to preparing and creating a productive and employable workforce in the modern economy.

As recovery from the COVID-19 crisis starts and re-opening of schools and universities begins, MoEC and MoRA can utilize data gathered about online learning on both private and public sites during the shutdown. Information from this experience can be used to expand popular offerings, address bottlenecks and other challenges and expand nascent partnerships with the private sector.

Care needs to be taken in setting up partnerships, as interests of students, teachers and schools do not always align with those of EdTech firms. As firms seek growth and profit, they may be reluctant to invest in upgrading teacher skills, or may promote products that are not fully or appropriately developed. Teachers may also resist learning and adopting new tools that may initially increase their workload. Integrating EdTech effectively and equitably is a difficult process and needs to be managed carefully. Pilot partnerships (Section 8.5.2) and startup assistance organizations (Section 8.3) are promising places in which to start.

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APPENDIX

Appendix A: List of Interview and Survey Candidates

This work greatly benefited from interviews and discussions with many organizations and individuals in the ecosystem. We would like to express our gratitude to the following people for taking the time to share their valuable insights and experiences with us.

	Interview Respondents		
	EdTech Companies		
	Name	**Organisation**	**Designation**
1	Paul Sabda	Zenius Education	Founder & Former CEO (also, Chairman of Board at INETA)
2	Gerald Ariff	HarukaEdu	Co-founder & Chief partnership Officer
3	Ronald Ishak	Hactiv8 Indonesia	Managing Partner
4	Danny Saksono	Quintal	Founder and CEO
5	Dipo Satria	DANAdidik	CEO and Co-founder
6	Hary Candra	PesonaEdu	Founder
7	Winastwan Gora	Kelase	Director and Founder
8	Tommy Yuwono	Pintek	Co-founder & Director
9	Allana Abdullah	Bahaso	Founder and CEO
10	Yuta Funase	Quipper	Indonesia Country Manager
11	Tigran Adiwirya	Websis	Co-founder and Executive Chairman
12	Omar Ramadhan	Websis	Co-founder and CEO
13	Paul Soegianto	Endless OS	Indonesia Country Manager
14	Zainal Abidin	Sikad	Founder and CEO
15	M. Ainur Ronny	Ngampooz	Founder
16	Ganis Samoedra Murharyono	Google for Edu	Head of Education Development, Indonesia
17	Obert Hoseanto	Microsoft	Sr. Engagement Manager
18	Tomy Yunus	Cakap by Squline	Co-founder and CEO
19	Kurie Suditomo	Coding Indonesia	Co-founder
	Investors		
	Name	**Organisation**	**Designation**
1	Sandra Restu Surya	Patamar capital	Investment Analyst
2	Ellen Nio	Patamar capital	Investment Associate
3	Aditya Kamath	Northstar	Executive Director

Survey Respondents					
EdTech Company			Investors		
	Name	Organisation		Name	Organisation
1	Winastwan Gora	Kelase	1	Tanisha Banaszczyk	Convergence Ventures
2	Hary Candra	PesonaEdu	2	Dondi Hananto	Patamar Capital
3	Salsa Wigati	Akademi CIPS	3	Mason Tan	Garden Impact Investment
4	Zaki Falimbany	Codemi	4	Maria Natashia	Prasetia
5	Rizky Ariestiyansyah	IndonesiaX	5	Dyota Marsudi	Vertex Ventures
6	Anton Wardaya	WARDAYA COLLEGE	6	Ashley Suhalim	Intudo Ventures
7	Gede Jiwo Wirasmoro	Websis for Education	7	Melina Subastian	Alpha JWC
8	Dipo Satria	DANAdidik	8	Aditya Kamath	Northstar
9	Tasa Nugraza Barley	Circledoo			
10	Gerald Ariff & Novistar Rustandi	PT Haruka Evolusi Digital Utama			
11	Aswin Tanzil	edConnect			
12	Paul Sabda	PT Zenius Education			
13	Hanny Agustine	DIGIKIDZ			
14	Tommy Yuwono	Pintek			
15	Ronald Ishak	PT Hacktivate Teknologi Indonesia			
16	Adam Ardisasmita	Arsa Kids			
17	Danny Saksono	Quintal			
18	Frisky Nurmuhammad	Ikigai			
19	Rizky Muhammad	Youthmanual			
20	Muhammad Ainur Rony	Ngampooz			
21	Ian McKenna	InfraDigital Nusantara			
22	Dimas Ramadhani	Cozora			
23	Susli Lie	Dana Cita			
24	allana abdullah	bahaso			
25	Jupiter Zhuo	Bali Cipta Inovator			
26	Yuta Funase	Quipper			
27	Jourdan Kamal	maubelajarapa.com			
28	Silvia Triana Sari	Utakatikotak.com			
29	Nurul wakhidatul ummah	Cakra			

Appendix B: List of EdTech Companies Identified

No	Name	Founding Year
1	7Pagi	2013
2	AIMSIS	2013
3	Akademi CIPS	2017
4	AksaraMaya	2011
5	Arkademi	2017
6	Arsa Kids	2011
7	Bahaso	2015
8	Bali Cipta Inovator	2017
9	Bintang Sekolah/Garuda Media	2013
10	Circledoo	2017
11	Clevio Coder Camp	2013
12	Codemi	2013
13	Coding Indonesia	2013
14	Cozora	2016
15	Dana Cita	2017
16	DANAdidik	2015
17	Digidu	2013
18	DIGIKIDZ	2001
19	edConnect	2015
20	Educa Studio	2011
21	Eductory	2011
22	Eduindo	2015
23	Endless Computers	2018
24	Eztudia	2015
25	Google for Edu, Indo	2018
26	HarukaEdu	2013
27	Homework Hero	2015
28	Ikigai	2018
29	IndonesiaX	2015
30	InfraDigital Nusantara	2017

No	Name	Founding Year
31	Inibudi	2013
32	Inspira Academy	2017
33	Kelas Bahasa	2016
34	Kelase	2014
35	Kelaskita	2012
36	Koding Next	2017
37	LeanSkill	2016
38	Lexipal	2014
39	maubelajarapa.com	2014
40	MejaKita	2016
41	Microsoft for Edu, Indo	2013
42	Ngampooz	2018
43	PesonaEdu	1986
44	Pendidikan.id (Mahoni Edukasi)	N.A.
45	Pintek (formerly Pinduit)	2018
46	Hactiv8 Indonesia (Hacktivate Teknologi Indonesia)	2016
47	Zenius Education	2007
48	Quintal	2015
49	Quipper (Indonesia)	2015
50	Rabbit Hole	2013
51	Ruangguru	2013
52	Scola	2016
53	Sekolahpintar	2009
54	Sikad	2015
55	Cakap by Squline	2013
56	Sukawu	2015
57	UtakAtikOtak	2013
58	Wardaya College	2012
59	Websis for Education	2015
60	Rencanamu (formerly Youthmanual)	2015

Appendix C: Description of Product and Services with Selected Examples

EdTech product and services	Product/service description	Selected examples
Classroom Tools	Classroom technology and tools help teachers to implement interactive teaching methods and make the lessons more engaging. Such tools have the ability to improve thinking skills while improving student engagement and learning retention. Such products may offer features such as live lectures, discussion forums, cloud-based student response tools and other classroom communication tools.	Google Classroom, Microsoft Teams, Circledoo
Technology Learning	Such platforms provide combination of offline and online learning solutions that cater specifically to teaching programming and other engineering disciplines.	Hactiv8, Inspira. Academy, Koding Next, Bali Cipta Innovator
Digital books/ Interactive Content	Digital content developers help to convert exiting textbooks and print books into digital books. Digital content developers often partner with educational institutions, governments and book publishers to translate the print content into digital content. The layout of textbooks is often retained to maintain the familiarity for teachers and students.	PesonaEdu is the oldest EdTech company in Indonesia, that specializes in making learning more engaging for students and teachers by embedding interactive learning objects into digital textbooks.
Early Childhood Education	Early childhood education startups focus on creating educational games and educational toys for children, including interactive storybooks and educational mobile apps. They focus on providing game based and blended learning to provide playful experiences to early childhood learners.	Arsa Kids, Digikids, Educa Studio, Rabbit Hole
Education Events Marketplace	These are online platforms that provide tickets and information about various events (such as seminars, trainings, competitions, etc.) around university and other educational institution campuses.	Ngampooz
Education Hardware	Companies in this category provide low-cost digital devices (such as laptops, notebooks, etc.) or enabling hardware technology solutions with built in educational tools to provide learners access to various digital educational content and learning applications.	Google Chromebook, Endless Computers
Language Learning	Companies in this category facilitate language learning for non-native speakers either by providing pre-developed content or by connecting the learners with native speakers. Such platforms cater to learners across the age spectrum, whether they are in school or adults looking to develop new language skills.	Cakap by Squline, Bahaso, Kelas Bahasa

EdTech product and services	Product/service description	Selected examples
Learning Application for Special Needs Children	Such platforms provide digital learning solutions and educational content for students with special needs.	Lexipal is a reading and learning platform for children with reading difficulties and dyslexia.
LMS	The EdTech companies in this category primarily develop and provide software solutions that improve parent-teacher-student communications, monitor student performance and progress, track assignments, share educational content, help teacher auto-generate reports and provide facilities for collaboration amongst teachers and students.	Quintal, Sikad, Codemi, Scola
Broad Online Learning (Higher Education/ Vocational Courses)	This category is the most common and largest in terms of products in Indonesia. Such products deal in providing educational content across diverse subjects ranging from traditional subjects (such as math, science, IT, business) to more vocational subjects (such as photography, entrepreneurship, music). They have popularized the concept of massively open online content—MOOCs. The MOOC providers have started to demonstrate a shift toward MOOC-based OPM (Online program management) models. Such models support educational institutions to convert their offline programs and courses to online.	HarukaEDU is one of the largest OPM providers that supports universities in Indonesia to convert their offline courses into online learning and degree programs. Examples for MOOCs include: Akrademi CIPS, Kelaskita, IndonesiaX
Online Learning (K-12)	The EdTech companies in this category develop and provide content, multiple products and learning material for K-12 students. Many companies under this category provide self-learning content, interactive learning platforms and study tools that help students expedite the learning process and interactive online services that help students with their assignments. Many companies also place special focus on providing exam preparation solutions for students to prepare for standardized exams, such as national exams (UN and SNMPTN) and entrance exams for state universities.	Ruangguru, Zenius, Quipper, Wardaya College
Online to Offline	These products offer platforms for learners or students to find face-to-face or offline tutoring, classes or workshops.	Maubelajarapa, Sukawu, Ngampooz
School Administration	Companies in this category provide software-based solutions to simplify the administrative tasks of schools, such as digitizing transcripts, school fee management and online payments, facilitating school-wide communication, online examination and assignments and admissions support and application tracking.	InfraDigital Nusantara, edConnect, 7Pagi

EdTech product and services	Product/service description	Selected examples
Social/ Collaborative Learning Platform	Such companies provide social media-like features to improve peer-to-peer (P2P) communication and collaboration both during class and outside class. Such EdTech providers sometimes also provide services to educational institutions to set up their personalized online learning environment to facilitate collaboration amongst students.	Kelase, UtakAtikOtak
Career Planning and Counselling	Companies under this category provide career planning and counselling tools to help students find the relevant universities and majors based on their personality. Such companies provide career-planning tools to allow students to perform a set of psychometric assessments, that can provide students with real-time suggestions on the most relevant college majors, college and career options for them.	Rencanamu (formerly Youthmanual), Ikigai
Student Loans and Finance	The companies in this category are a crossover between EdTech and FinTech. These companies provide lending platforms to offer affordable loans for students to fund their tertiary education and training (formal or non-formal). The mission of such companies is to democratize the access to higher education across Indonesia.	Danacita, DANAdidik, Pintek
Technology Adoption Consulting	With the help of various professional development programs and phasing out the implementation process, these technology adoption consulting companies provide support educational institutions to adopt and integrate with available digital solutions to become more productive. They provide consulting and counselling to help educators overcome the initial inertia of technology adoption and ease them into complete digitization and adopting mobile technology solutions by breaking down the technology adoption into multiple levels of implementation.	Websis, PesonaEdu