Future Skills Alliance
The Asia Foundation

DIGITAL SKILLING IN ASIA AND THE PACIFIC

Efforts of Asia-Pacific's Corporate Sector

2023

Digital Skilling in Asia and the Pacific: Efforts of Asia-Pacific's Corporate Sector

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The Asia Foundation is a nonprofit international development organization committed to improving lives and expanding opportunities across Asia and the Pacific. Informed by decades of experience and deep local expertise, our work across the region is focused on good governance, women's empowerment and gender equality, inclusive economic growth, environment and climate action, and regional and international relations.

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The Asia Foundation

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Introduction

The Covid-19 pandemic brought not only a health crisis but also an economic crisis in Asia and the Pacific. In 2020, the region was expected to grow by less than 1%.[1] In Southeast Asia, the economy was expected to contract by 3.8% in 2020.[2] For the first time in two decades, poverty is expected to increase, with roughly 5 and 9 million more people forecasted by the World Bank to fall into extreme poverty in the East Asia and Pacific in 2020.[2] In addition to the broader economic impacts of Covid-19 worldwide, women and youth were pushed out of the labour force during the pandemic.

Research shows women's jobs are 1.8 times more vulnerable than men's, and even though women account for 39% of global employment, they make up 54% of all job losses.[3] In Thailand, for instance, women represented roughly 91% of manufacturing job losses and 58% of overall job losses, according to the Asian Development Bank.[4] Roughly 220 million young people, about one in three young people, were employed in 2020, yet they were especially vulnerable to the impacts of labour market disruptions.[5] With rapid digitalisation and job market changes, Covid-19 created 'double disruption' for workers across the region, with women, youth, and other marginalised groups disproportionally impacted.

Because of this, businesses, governments, and non-profit organisations will need to collaborate to future-proof and re-skill people for new opportunities in the digital economy. In response to these challenges, The Asia Foundation's Future Skills Alliance (FSA) offers a pathway for businesses to contribute to environmental, social, and governance efforts across Asia-Pacific.[a] By investing their unique assets in a collective impact model, all partners contribute to driving impact at a regional scale.

Over the past decade, public and private sector institutions have implemented a wide range of digital skilling programs. Given the demand for upskilling and re-skilling the workforce, these programs often have overlapping objectives and content. Some programs also target similar audiences. A plethora of digital skilling programs is beneficial to the Asia-Pacific population. However, due to the lack of information on the digital skilling landscape, there is a tendency to duplicate existing efforts on the ground. To streamline these initiatives, it is essential to address these knowledge gaps and work in a complementary manner with public and private

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[a] The Future Skills Alliance (FSA) is an initiative of The Asia Foundation. It is a broad coalition of partners from both the public and private sectors working together to deliver future skills at scale to the region's hard-to-reach communities. The FSA creates a pathway for businesses to contribute to environmental, social, and governance efforts across Asia and the Pacific. By investing their unique assets in a collective impact model, all partners contribute to driving impact at a regional scale.

sector institutions. The FSA offers a framework for these sectors to work with like-minded institutions.

Informed by the broader agenda of the Future Skills Alliance, this research project seeks to address the research gaps in digital skills initiatives in the Asia-Pacific region driven by Chinese, Indian, Japanese, and South Korean companies. All four countries are equipped with advanced and emerging technology sectors which are likely to be implementing corporate social responsibility (CSR) and/or shared value programs domestically and in other countries. In 2020, China's digital economy accounted for 39% of its GDP despite the pandemic.[6] In India, the Information Technology and Business Process Management (IT-BPM) market accounts for 9% of India's GDP and 56% of the global outsourcing market.[7] India has a competitive advantage, with the third-largest ecosystem for start-ups globally.[8] Japan is also known for its strong Information and Communications Technology (ICT) sector, which accounts for 8.7% of the country's industries.[9] It held 6.9% and 6.4% of the global ICT market in 2018 and 2019, respectively.[9] South Korea, on the other hand, ranked first out of the 29 Organisation for Economic Co-operation and Development (OECD) countries in the 2019 OECD Digital Government Index.[10] South Korea is also prioritising its digital economy as evidenced by the proposed 2.7 trillion won-investment its Digital New Deal in 2020.[11,12] Given the scale of these four countries' technology sectors and their expanding global footprints, it is critical to understand what and how companies are contributing to address the gaps in digital skilling regionally. Government policies, along with market demand, must also be examined to see how private sector contributions align with these efforts.

This research tackles the following questions:

1. What are the digital skills initiatives of Chinese, Indian, Japanese, and South Korean companies in the Asia-Pacific region?
2. What are these initiatives addressing, and how do they contribute to bridging the digital skills gap in the Asia-Pacific region?
3. In what ways do these digital skills initiatives in the region align with the four countries' regional strategies related to the digital economy?
4. What are the opportunities for private sector-initiated digital skills programs in relation to the regional strategies of their respective countries?

Desk research was conducted from July to August 2022 on the digital skills landscape in China, India, Japan and South Korea and their existing national policies and regional strategies related to the digital economy. CSR reports, press releases, news articles, annual reports, and official websites of Chinese, Indian, Japanese, and South Korean companies were reviewed to create an inventory of their existing digital skills initiatives. A limitation of this

research is that there is restricted information on the funding, implementation, and timelines of these initiatives. This is because majority of the digital skilling programs from the desk research were newly launched. The author recognises that the desk research may not have captured initiatives that were not reported in English and acknowledges that the inventory created for this report is not an exhaustive list. It also excludes internal digital skilling programs or programs only for employees of their respective companies. Journal articles, government reports, and grey literature were used to examine the four countries' digital economy policy frameworks nationally and regionally.

The main findings are:

- Digital skills initiatives by Chinese corporates tended to focus on enhancing digital skills of women and girls. At the time of writing, there were ten digital skills programs by Chinese corporations in the Asia-Pacific region, excluding domestic initiatives in China. These initiatives by Chinese companies are well-aligned with the policy objectives of the Digital Silk Road (DSR), which is Beijing's main strategic umbrella in advancing China's digital technologies at a global scale. As China seeks to expand its presence in the region, opportunities arise for Chinese corporates to participate and contribute to the realisation of the DSR. Supporting and implementing digital skills initiatives in the region fosters people-to-people engagement and human development with partner countries.

- Indian corporates undertake a strategic approach in their digital skilling initiatives, seeking longer-term and broader partnerships. Of the 20 programs, 13 were available globally or to at least one country in the Asia-Pacific region. Students, teachers, businesses, startups, jobseekers and graduates, and educational institutions are some of the target audiences of Indian corporate-initiated programs. Therefore, the approach of India's corporate sector presents an opportunity to advance and concretise its digital economy strategy in the Asia-Pacific region and to expand the role of India's private sector in its foreign policy. These initiatives put Indian companies in a unique and strong position to foster partnerships between the Government of India, particularly through its foreign policy strategies in the digital economy, and their partners in the Asia-Pacific region under New Delhi's 'Act East' policy.

- Japan's corporate sector has the most number of digital skills initiatives and has the broadest scope among the four countries of interest in this project. Of the 40 programs, 13 were implemented or are being implemented globally, regionally, or in multiple countries. 12 were based in Australia and Asian countries such as Malaysia, Vietnam, Singapore, India, and Indonesia. Japanese corporates tended to focus on education-related initiatives beyond the Asia-Pacific region. Considering the Japanese private

sector's experience in infrastructure exports and public diplomacy, these existing digital skilling initiatives can be further integrated into Japan's 'Free and Open Indo Pacific' (FOIP) vision through the digital skilling space.

- Digital skills initiatives of South Korean companies were concentrated in Europe, specifically the UK, and less than a quarter were available to the Asia-Pacific region. Meanwhile, the digital skills initiatives of the South Korean corporate sector in Vietnam outnumbered other Southeast Asian countries. Like Japan, there was an overwhelming focus on education, targeting youth, students, educators, and schools; however, the presence of apprenticeships and on-the-job experiences stands out. Since a significant proportion of these initiatives were concentrated in Europe, South Korean companies can expand these digital skills initiatives in the Asia-Pacific region and integrate themselves into South Korea's foreign policy initiatives.

1. Covid-19, digitalisation, and its impacts in the Asia-Pacific region

The Asia-Pacific region has felt the public health, social, and economic impacts of the Covid-19 pandemic since its onset in 2020. As of 9 September 2022, 153.1 million people have been infected with the virus.[13] The majority of the countries in the region lack the healthcare capacity to mitigate the virus, considering their spending on health per capita and their healthcare services being financed out of pocket by their citizens.[14] Notably, out of the 39 countries in the region listed by the UN OCHA as of 9 September 2022, only six countries had a low COVID-19 risk class, namely Australia, Brunei Darussalam, Japan, South Korea, New Zealand, and Singapore.[13] The rest of the countries were categorised as having medium, high or very high risk. In addition, seven countries in the region had vulnerable populations of more than 5 million, such as Thailand, Indonesia, the Philippines, Vietnam, Bangladesh, Myanmar, and Afghanistan.[13] On top of these challenges, almost 1 billion people in the region were yet to receive their first dose of a COVID-19 vaccine as of June 2022, being at risk of serious illness and death from the virus.[15]

As governments in the region implemented policies to mitigate the spread of Covid-19, digital transformation accelerated. Certain businesses and industries adapted digital technologies ahead of other sectors, and this digital transformation decreased costs and generated wider customer reach during the pandemic.[16] The health sector, in many ways, has benefited from the adoption of digital technologies. For example, in Vietnam, digital health applications were created for the following purposes: 'surveillance and contact tracing, health communication, telemedicine and Artificial Intelligence to support diagnosis and treatment.'[17] In Queensland, Australia, a web-based application was developed to provide information about quarantining, contributing overall to the Covid-19 mitigation strategy of the state.[18] Despite the benefits of digital transformation during Covid-19, challenges with deployment, training, infrastructure, and governance remain to be addressed in the health sector.[17,19,20]

Despite its advantages, digital transformation has widened the digital divide in the region. According to Jun, Park and Kim[21], the Asia-Pacific region will be the most digitally divided region by 2025 compared to North America, Europe, Latin America and the Caribbean, and Africa. Within the Asia-Pacific region, Southeast Asia had the widest disparity in terms of the digital transformation index.[21] It is not surprising given that the regional environment in Southeast Asia is a highly contested space, where 'governments and private companies seek to both drive economic growth and protect and control data flow'.[22] Large tech companies tend to overshadow micro, small, and medium enterprises (MSMEs) in the digital economy.

As digital transformation progresses and the digital divide deepens, unemployment becomes more evident. The unemployment rate in the Asia-Pacific region worsened during the pandemic, particularly for small island developing states (SIDS) in the Pacific.[14] Working hours also diminished in all Asia-Pacific economies in 2020, with lockdowns and job losses being the contributing factors.[23] Nepal (17.4%), India (13.7%), the Philippines (13.6%), Myanmar (13.4%), and Bangladesh (12.2%) were the five countries that witnessed the largest working hour losses among all Asia-Pacific countries in 2020.[23]

This brings the discussion to the pandemic's impact on the informal sector, where a large proportion of people in the region participate. For example, in Thailand, informal sector workers witnessed a drastic decline in their income, forcing them to draw on savings and or acquisition of more debt.[24] In South Asia, on the other hand, more than 80% of workers engaged in activities in the informal sector and more than 90% of the businesses are considered informal.[25] When the pandemic hit, 44% of informal workers became unemployed in India by April 2020.[25] Amid these issues, there is an opportunity to 'accelerate, catalyze, and go beyond the conventional straight-jacketed technology, economic, and policy solutions for the informal sector.'[26]

MSMEs in the region also faced their own challenges during the pandemic. While MSMEs are diverse, reduction in employment and decrease in sales revenue were common problems at the onset of the pandemic.[27] Digitalisation may be beneficial for MSMEs. For instance, when online sales account for more than 40% of a business' total sales, it can generate more revenue and employment for MSMEs.[28] However, adopting digital technologies brings risks to MSMEs along with its benefits, some of which are 'cybersecurity and data privacy concerns', 'exposure to digital fraud', 'online misinformation', 'asymmetric market power and platform dominance', and 'persistent digital divide and infrastructure-related issues'.[29] Certain industries, particularly food processing, textiles, tourism, food and drink services, and education, were disproportionally affected during the pandemic.[28] In Southeast Asia, although both men- and women-led enterprises experienced challenges during the pandemic, women-led MSMEs were as or more likely to adapt and implement strategies to keep their businesses afloat.[30] Overall, there remains a big gap to fill in terms of supporting MSMEs as they navigate their adoption of digital technologies.

Similarly, women in Asia-Pacific were exposed to difficulties in seeking employment, doing carework, and accessing support. In terms of employment, women were at risk of losing their employment as they accounted for a majority of part-time and casual workers in the region.[31] Although 80% of people experienced reduced income when Covid-19 hit, women were significantly less likely to have access to personal income than men.[32] These issues can be

attributed to the disproportionate amount of unpaid labour being carried out by women. According to the Asian Development Bank and UN Women, 'The proportion of women whose main economic activity is unpaid care and domestic work has increased in all countries, except for the Solomon Islands.'[32] Similarly, The Asia Foundation's research on the care economy emphasised the immense disparity in the amount of carework performed by women in Asia-Pacific.[33] Women were also exposed to an increased risk of gender-based violence, also referred to as the 'shadow pandemic', because the true number of incidents during Covid-19 can only be estimated.[34,35] Women also needed support in obtaining the necessary digital skills to achieve their goals in the digital economy. For instance, in terms of computer program writing, the proportion with this ability is 7.8% for men compared to 3.5% for women in 49 economies in 2017, according to the International Telecommunication Union.[36] However, challenges experienced by women in the region go beyond access to digital skills. For women who were already part of the science, technology, engineering and mathematics (STEM) workforce, increased workload (30%), mental health issues (50%), and lack of access to flexible work for people with caring responsibilities (only 56% had access to flexible work) were some of the hurdles faced by the women participants in a study by the Australian Academy of Science.[37] Despite this, 72% of the women participants wanted to remain in the STEM workforce in the short-term.[37]

Asia-Pacific's young people were among the groups that felt the impacts of the pandemic. The International Labour Organization and the Asian Development Bank estimate that 660 million young people in Asia-Pacific are finding it difficult to acquire employment.[5] They have identified three main employment hurdles for the youth, '(1) job disruptions from reduced working hours and layoffs, (2) disruptions in education and training as they try to complete studies, and (3) difficulties transitioning from school to work and moving between jobs.'[5] These challenges were exacerbated by the pandemic; however, experiencing inequality in the labour market and being driven to participate in the informal sector are unfortunately not new to young people in the Asia-Pacific region.[38] Yet, it is encouraging that young people have adapted to the digitalisation of services and commodities. A study by the World Economic Forum in the Association of Southeast Asian Nations (ASEAN) region found that more than 50% of young people used and learned about digital tools for social media.[39] 45% and 42% of young people used digital tools for online education and e-commerce, respectively.[39]

Persons with disabilities also faced a variety of problems, ranging from unemployment to isolation, amid the pandemic. 15% of the 690 million persons with disabilities live in the Asia-Pacific region.[40] A worrying statistic is that 'persons with disabilities are two to six times less likely to be employed than those without disabilities.'[41] Unemployment was intensified by Covid-19. Persons with disabilities found it difficult to seek employment opportunities, along

with public health information.[40] Although strides have been made in terms of adopting a more holistic policy approach and reinforcing rights-based frameworks to support persons with disabilities, the disparity remains. According to the UN Economic and Social Commission for Asia and the Pacific, '[…] large gaps in the employment status of persons with disabilities compared to the general population, coupled with challenges brought about by the rapidly changing world of work, reveal that more needs to be done to promote productive employment and decent work for persons with disabilities.'[42] This means that there is much work to be done to bolster support systems for persons with disabilities, and digital technologies can contribute to this endeavour. As Raja argues, accessible digital technologies can 'level the playing field for persons with disabilities' in various life domains.[43]

The daily realities experienced by women, informal workers, young people, and persons with disabilities during the pandemic highlight systemic inequalities that persist. While the rapid digitalisation brought by Covid-19 benefited certain industries and accelerated the creation and adoption of digital technologies, it has also intensified the digital divide, impacting the most marginalised communities in the Asia-Pacific region. Within this context, the following section will look at the initiatives of corporate sectors in China, India, Japan, and South Korea and examine how these efforts contribute to addressing the digital skills gap in the region.

2. Digital skills initiatives of corporate sectors in China, India, Japan, and South Korea

Conceptualisations of digital skills

Digital skills are defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as the ability to 'use digital devices, communication applications, and networks to access and manage information.'[44] Because the term 'digital skills' covers a broad set of capabilities, digital skills can be seen as a spectrum varying in complexity. Figure 1 below shows the digital skills spectrum according to Salesforce.[45] Entry-level digital skills include computer literacy, data entry, social media, web-based communications and research, word processing, email and chat, and secure information processing. Meanwhile, the following are considered advanced digital skills: programming, web and app development, digital business analysis, digital marketing and content creation, digital design and data visualisation, digital product management, data science, and user experience design.

Figure 1. Digital Skills Spectrum
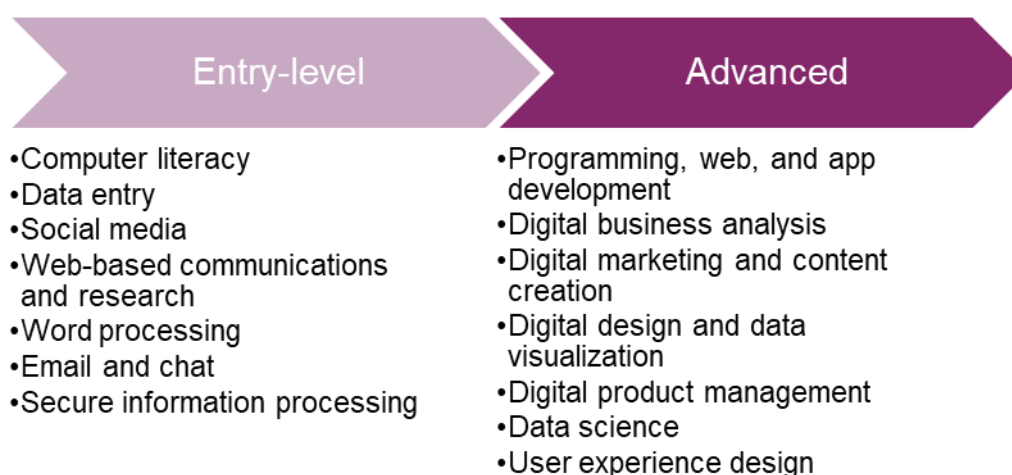
Source: Salesforce[45] | Graphic: Author

Similar definitions emphasise the operational and functional aspects of digital skills. van Laar *et al.* define digital skills in the context of the 21st century as '(1) the mastery of ICT applications to solve cognitive tasks at work; (2) skills that are not technology-driven, as they do not refer to the use of any particular software program; (3) skills that support higher-order thinking processes; and (4) skills related to cognitive processes favoring employees' continuous learning.'[46] Digital skills can be viewed in terms of the medium and the content. For instance, van Dijk and van Deursen offer a unique typology of digital skills: 1) operational skills, 2) formal skills, 3) information skills, 4) communication skills, 5) content creation skills, and 6) strategic skills (see Table 1).[47] Operational skills, as discussed previously, refer to the skills required to operate digital technologies.[45,47] In terms of internet use, this category of skills includes the

ability to operate mobile internet, the internet environment, and internet-based search engines.[48] Formal skills involve the process of learning and gaining familiarity with the medium and its characteristics. Having formal skills in the context of internet use can mean that a person does not have trouble looking for information or navigating websites.[48] Meanwhile, an information skill is defined as 'the ability to search, select, and evaluate information in digital media.'[47] While this category bears similarity with formal skills, information skills, in the context of internet use, cover the following proficiencies: identifying the appropriate keywords to conduct an internet search, evaluating the quality of information, and triangulating information online.[48] Communication is also considered a digital skill. Communication skills include knowing what information is appropriate to share online, how to conduct oneself in an online environment, and what communication tones should be used in different social contexts.[48] Content creation skills refer to generation of content by users which may range from 'writing of text', 'recording or assembling of pictures, videos, and audio programs', and 'compiling a personal profile and producing messages and images on a social networking site.'[47] Lastly, strategic skills are 'the ability to use the digital medium as a means for a particular personal or professional goal.'[47] Moreover, van Dijk and van Deursen's typology offers a perspective that goes beyond the practical and operational facets of digital skills.

Table 1. van Dijk and van Deursen's range of digital skills

Type of digital skill	Definition
Operational skills	'Technical competencies required to command a computer or the Internet'
Formal skills	Process of 'learning' the characteristics of every medium
Information skills	'The ability to search, select, and evaluate information in digital media'
Communication skills	'The use of email, chatting, instant messaging or tweeting, preparing profiles on social media or online dating, and contributing to online communities'
Content creation skills	Generation of content by users which may range from 'writing of text', 'recording or assembling of pictures, videos, and audio programs', and 'compiling a personal profile and producing messages and images on a social networking site'
Strategic skills	'The ability to use the digital medium as a means for a particular personal or professional goal'

Generally, policy tends to define digital skills as synonymous with operational digital skills and uses this definition to evaluate digital competence. Measurement of digital skills, often through surveys and course exams, 'use a limited definition of digital skills that does not go beyond operational skills.'[49] While concentrating on the ability to use digital technologies is essential, this increasingly digitalised world demands more complex abilities in order to navigate, discern, and thrive in it. In writing this research report, the author recognises these other facets of digital skills beyond the operational side and has decided to focus on van Dijk and van

Deursen's typology of digital skills.[50] As demonstrated in the previous chapter, the rapid digitalisation brought by the pandemic emphasises the urgent need to address the digital skills gap in the Asia-Pacific region. This chapter of the report looks at the digital skills initiatives of the corporate sectors of China, India, Japan, and South Korea, keeping in mind the various facets of digital skilling.

Digital skills initiatives in the Asia-Pacific region

Over the past decade, the corporate sector has been ramping up its efforts to bridge the digital skills gap. This section looks at the various initiatives of Chinese, Indian, Japanese, and South Korean corporates in the region, excluding domestic programs or programs within their respective countries. It will also highlight the target audiences, the range of digital skills[47], the locations of these digital skills initiatives, and the implementation and partnership strategies. Initiatives included in this research report including funding announcements, partnerships, and specific programs. Local subsidiaries of Chinese, Indian, Japanese, and South Korean corporates are included in this list. As mentioned, the desk research may have failed to capture initiatives that were not reported in English.

China: Focusing on women and girls' digital skills

China plays a critical role in the digital economy global value chain. In 2020, China's digital economy accounted for 39% of its GDP despite the pandemic, an improvement from 2018 at 34.8%.[6,51] At the dawn of the digital age, China's approach was to implement a 'twin-track strategy' that merges industrialisation and informatisation, and digital technologies were 'the new epicentre of economic growth and market reforms in the 2000s' as China enacted its 'state-centred approach to economic development and restructuring.'[52,53] According to Dai, '[…] it has long been government strategy that foreign direct investment (FDI) and the importation of foreign products in the ICT sector should lead to technology transfer from foreign firms to Chinese firms.'[53] This approach was implemented in conjunction with the promotion of local technological development and the enhancement of institutional governance amid industrialisation and informatisation in China.[53]

This strategy paved the way for a complex digital ecosystem in China, consisting of state and non-state actors. The private sector, particularly digital champions such as Baidu, Alibaba, Tencent, and their competitors, contributed to this endeavour. According to Yu, they have been working closely with the Chinese government to develop China's domestic digital economy, while promoting 'e-entrepreneurship, e-consumerism, e-surveillance, and e-solutions to various issues and problems through big data, cloud computing, IoT (Internet of Things), and an array of digital computing technologies.'[52] China's industrial policies have been recently concentrating on digital technologies such as 'artificial intelligence, 5G

telecommunications, and smart networks', but even though these initiatives are state-led, private firms are critical in ensuring the success and implementation of these policies.[54] Not only have Chinese firms contributed to China's economic development and its rise to becoming globally competitive in the digital economy, they are also advancing the realisation of China's regional policies, such as the Digital Silk Road.[54]

While privately-owned Chinese companies are critical to China's domestic economy, fewer initiatives were found in the digital skilling space by Chinese corporates compared to their Indian, Japanese, and Korean counterparts. At the time of writing, there were 11 digital skills programs by Chinese corporations, with ten in the Asia-Pacific region, excluding domestic initiatives in China. Five of these programs were initiated by Huawei subsidiaries in Malaysia, Indonesia, and Bangladesh, and another government-sponsored program in Indonesia was implemented in partnership with Huawei. Huawei also rolled out a regional initiative in Asia-Pacific called Seeds for the Future 2022 which aims to develop local talent in the ICT field. The Alibaba Group started the Global E-Commerce Talent program in 2018 and launched the Alibaba Netpreneur Training Program in the Philippines, Indonesia, and Africa in 2022. The Ant Group, an affiliate of the Alibaba Group, through the Ant Foundation, also announced their five-year initiative with UN Women to support women-led MSMEs in Southeast Asia. Lastly, TikTok, which is owned by ByteDance, announced its project to address the digital skills gap and youth unemployment in the United Kingdom. From these programs, it can be observed that Chinese corporate-initiated programs are concentrated in the Southeast Asian region.

Women and girls are the primary target audience of digital skills initiatives by Chinese corporates. Of the ten programs in the Asia-Pacific region, seven aim to recruit women and girls. For instance, Huawei partners with the Women Leadership Foundation in Malaysia to provide women leaders and talents working in the digital space to share their expertise through workshops and seminars. Huawei, with the ICT Division of the Government of Bangladesh and Robi Axiata, launched the Digital Training Bus project. Its mission is to 'bring digital skills to women in the heart of rural Bangladesh.'[55] The Ant Group, through the Ant Foundation, partnered with the United Nations Development Programme (UNDP) on Together Digital, 'a five-year programme to support women-led micro, small and medium-sized enterprises (MSMEs) and empower them to participate and thrive in the digital economy.'[56]

In addition, the initiatives of Chinese corporates tend to focus on operational and strategic skills. For example, while Alibaba's Netpreneur Training Program and Global E-commerce (GET) Talent Training Program seek to enhance the digital skills of its participants, the overarching aim is to help MSMEs develop their businesses. In the UK, TikTok's initiative targets the youth and offers an employability course, access to a career coach, virtual work

experience, mental health support, and access to a bursary and mentoring. Moreover, initiatives by Chinese corporates go beyond operational skills. These programs also focus on developing the employability of their participants and profitability of participating MSMEs. The same can be said for Huawei's Seeds for the Future Program, which provides an opportunity for participating youth to 'propose technical solutions to social problems.' While concentrating on these types of digital skills, Chinese corporate initiatives tend to have a gender focus and are located mainly in the Southeast Asian region.

India: Developing strategic partnerships in the region

In August 2022, India retained its status as the world's fastest-growing economy, with its GDP growing by 13.5% from April to June.[57] While the services sector holds the largest share in India's Gross Value Added (GVA), other industries are emerging.[58,59] For instance, the Information Technology and Business Process Management (IT-BPM) market accounts for 9% of India's GDP and 56% of the global outsourcing market.[7] Within a decade, this industry grew at an average annual rate of 30%.[60] In FY21-22, the computer software & hardware sector attracted the highest percentage of foreign direct investment (FDI) equity inflow, accounting for 24.6%.[61] India also has a competitive advantage, with the third-largest ecosystem for start-ups globally.[8] With India's startup ecosystem developing e-commerce platforms and due to pandemic lockdowns, its platform and gig economy has experienced a massive growth. According to NITI Aayog, an estimated 7.7 million gig workers in India are expected to increase to 23.5 million in 2029-2030.[62]

Historically, right after economic liberalisation in the 1990s, the Indian corporate sector has played a crucial role in the growth of its economy. From India's adoption of a mixed economy post-independence, economic reforms towards liberalisation opened opportunities for new players to break into the Indian corporate sector.[63] With these reforms, the non-financial corporate sector in India became a 'conduit' between its domestic economy and international financial markets, taking over the traditional role of development banks and financial corporates.[64] However, financial management in the corporate sector remains opaque, impacting capital market norms. For instance, MGC Global found that almost 67% of Indian private companies lack adequate risk management mechanisms and more than 52% do not have formal risk management processes.[65] This relates to what Vaidhyanathan identifies as critical reasons leading to corporate governance breakdowns: the 'non-adherence to regulations'; the lack of independence of directors and, in turn, lack of checks and balances or self-regulation; the limited diversity of boards particularly of family-owned multimillion-dollar companies; the 'lack of due compensation' for independent directors; and the 'lack of

technology enablement.'[66] Furthermore, India's corporate sector boasts of strong regulatory practices to uphold pillars of corporate governance, but challenges remain.

Indian corporates are also highly involved in India's social development through CSR initiatives. Conducting CSR programs was previously voluntary, but it has become mandatory over the last decade through the Companies Act 2013, making India the first to introduce statutory CSR.[67] From Section 135 of this Act, companies, including central public sector enterprises (CPSEs), are required to create a CSR committee, approve a CSR policy, and 'spend at least 2% of the average net profits of the three immediately preceding financial years in pursuance of their CSR activities.'[67–70] There are, of course, challenges with implementation. A study with a sample of almost 5,000 firms in India found that firms tend to 'manipulate accounting measures to avoid breaching the cut-off criteria for mandatory CSR.'[71] CSR is also heavily driven by various facets of ownership, for instance, multinational ownership and family control and management were found to be associated with 'higher levels of CSR engagement.'[72] Nonetheless, from the corporate perspective, these initiatives contribute to their public reputation. Aside from traditional CSR, Indian corporates have taken an interest and have been actively participating in government-initiated digital skilling programs, for instance FutureSkills Prime, under the government's Digital India programme.[73] As Kadyan states, 'Shortly we can say that CSR in India has gone beyond merely charity and donations and is approached in a more organized fashion. It has become an integral part of the corporate strategy.'[67]

Focusing on digital skills initiatives, which are commonly implemented under the CSR arm of Indian corporates, 20 programs were initiated outside India by 11 companies. These include programs outside the Asia-Pacific region. Of the 20 programs, 13 were available globally or to at least one country in the Asia-Pacific region. The company with the greatest number of initiatives was Tata Consultancy Services (TCS), an IT company headquartered in Mumbai. Since 2016, TCS has been implementing internship programs, reskilling and upskilling efforts, and hiring initiatives, in addition to entering into strategic partnerships. These programs were based in Australia, the UK, and Malaysia. Closing the Skills Gap, an initiative in partnership with the World Economic Forum (WEF), had a global reach. InfoSys, a multinational IT company based in Bangalore, launched two initiatives recently, the InfoSys Springboard in the United States and the Digital Innovation Partnership with Tennis Australia. In 2020, InfoSys held a two-day hackathon event called GovHack in Australia and New Zealand. Tech Mahindra, under the Mahindra Group, signed two memoranda of understanding with the Government of Bangladesh in 2019 and the Digital Economy Promotion Agency under the Ministry of Digital Economy and Society of Thailand in 2022. Both of these agreements seek to advance digital transformation, with Tech Mahindra assisting in areas such as Artificial

Intelligence, 5G, Analytics, Machine Learning, Cybersecurity, Blockchain, Internet of Things, and the Metaverse. Motherson, an Indian company supplying and manufacturing automotive parts, conducted child education and apprenticeship programs in the Americas, including Mexico. Wipro, an IT and consulting company headquartered in Bangalore, announced in 2020 that it would fund a Digital Innovation Hub in Düsseldorf, Germany. This Hub will 'serve as Wipro's flagship centre in Europe and will offer digital transformation expertise to companies in Germany, enable organisations to cross skill and upskill besides supporting talent development in local communities.'[74] Byju's, a multinational educational technology company, expanded its online educational technology platform for coding, math, and science, Byju's Future School, to the United States, United Kingdom, Australia, Brazil, Indonesia and Mexico in 2022. Lastly, Mach33.aero, Cloudnine hospitals, HCL Technologies, and Kosmoderma Healthcare Private Limited, are four companies that entered into new tech partnerships with the New South Wales (NSW) Government in Australia.[75] Out of the four countries of interest in this study, Indian corporates rank third in terms of the number of digital skilling initiatives. Within the Asia-Pacific region, majority of the Indian corporate initiatives were in Australia.

While Indian corporates have less initiatives compared to that of their Japanese and South Korean counterparts, it is apparent that they have entered into more strategic partnerships instead of one-off digital skilling programs. For instance, the recent partnership between Indian companies, Mach33.aero, Cloudnine hospitals, HCL Technologies, Kosmoderma Healthcare Private Limited, and the NSW Government in Australia covers a range of areas, from education to medical technology. The same can be said for InfoSys' five-year collaboration with Tennis Australia, which will result in a series of leadership programs, digital learning initiatives, and mentorship programs. Another Australia-based initiative is TCS' partnership with DeakinCo., a division of Deakin University in Melbourne, which 'brings together Deakin's academic excellence and TCS' extensive industry networks and experience.'[76] The first program of this partnership will 'focus on machine learning, which consists of three streams enabling senior executives, mid-management and practitioners to leverage the power of this emerging technology in their chosen profession.'[76] A similar strategic approach can be observed with Tech Mahindra's partnerships with key government agencies in Bangladesh and Thailand. While beyond the Asia-Pacific region, Wipro's Digital Innovation Hub is a similar initiative as it seeks to collaborate with organisations, institutions, and universities across Europe.

These initiatives are evidence of the strategic approach of Indian corporates, which seeks out longer-term and broader partnerships. It also follows that the majority of the programs commonly target strategic digital skills and operational skills, among others. Students,

teachers, businesses, startups, jobseekers and graduates, and educational institutions are some of the target audiences of Indian corporate-initiated programs. However, since these initiatives are broad and strategic in nature, the target audiences are less straightforward or not enough information is provided at the time the desk research was conducted.

Japan: Advancing education beyond the Asia-Pacific region

Japan is home to a strong ICT sector and a thriving corporate portfolio. Its ICT sector accounts for 8.7% of the country's major industries.[9] It held 6.9% and 6.4% of the ICT market in 2018 and 2019, respectively.[9] As for its corporate sector, 3.3 million corporations were recorded to be operating in Japan in 2016.[77] Japanese corporates are also active in the social responsibility space. During the pandemic, corporates in Japan focused on 'environmental sustainability with financial materiality and corporate strategy' and implemented third-generation or global-scale CSR.[78,79] It can be expected that Japanese corporates will be ramping up social responsibility efforts as senior executives have been recently incentivised to help address social issues. It is also important to note two key trends in the Japanese corporate sector. First, there is a shift from CSR to CSV or 'Creating Shared Value'. Instead of viewing the pursuit of social good as a separate entity, Japanese corporates are beginning to integrate this aim with their core business operations. This trend was also observed in other Asian countries, such as South Korea and India, where CSV is seen as a 'key to survival' of corporates and where 'firms are viewed not as outside and in opposition to society but as a part of and in society.'[80] Hayama explains, that under a CSV model, 'corporations try to turn specific social issues into business opportunities and pursue economic value and social value simultaneously, and eventually these shared value business activities related to the SDGs will bring benefits to corporations themselves.'[81] Second, Japanese industry leaders are beginning to use ESG-related venture capital initiatives or grant making foundations to support domestic initiatives and global needs. For example, MPower, 'Japan's First ESG-focused Global Venture Capital Fund', aims to support 'innovative companies drive sustainable growth and positive social and environmental impact through ESG integration.'[82] This fund invests in scalable companies focusing on 'demographic shifts and technological advance.'[82] While there is a body of research on CSR in Japan, how corporates contribute to skilling in the digital space requires further investigation. This transitions the analysis into Japan's national digital economy policy framework.

Japan's digital economy and corporate sector are ahead of its peers in Asia, but its policy framework is more complicated to assess. Over the past decades, Japan has introduced regulations simultaneously with digital transformation. For instance, the Antimonopoly Act, the Act on the Protection of Personal Information, and the Transparency and Fairness Act are

among these laws that safeguard its citizens in relation to digital platforms.[83] On a similar note, it is interesting that developments in Japan's regulatory laws are somehow influenced by legal advancements in Europe.[83] Japan has also prioritised digitalisation since 2020, which includes the establishment of a Digital Agency in 2021, digitalisation investments for SMEs, and funding for research and development in digitalisation.[84,85] With the limitations of its domestic labour market, Japan is also working towards 'reskilling' its workforce and Japanese firms are following suit.[86] For example, Mitsui Chemicals partnered with IBM Japan in 2022 to develop an in-house data science development training program for their production technology staff.[87] Overall, around US $765 million or JPY 100 billion is set to be invested in 2023 for digital transformation education, particularly for human resources development.[86] These developments followed Prime Minister Yoshihide Suga's announcement about his vision for Japan's digital transformation, which will be a 'pillar of the new growth strategy', shortly after his election in 2020.[88] Suga stated, 'We need to make an organisation with personnel of high ability from public and private sectors, which would lead digitisation in the overall society.'[89]

Amid these improvements, Japan continues to face challenges on its road to digitalisation. From a policy perspective, the lack of synergy and integration is one of the most pressing issues for Japan, with Digital Transformation Minister Takuya Hirai calling this a 'digital defeat.'[88] Suzuki clearly explains this challenge, 'Each ministry and municipality has its own customized IT systems, making it difficult to share information. Critics said the so-called vendor lock-in, in which municipalities became dependent on certain system vendors, inflates costs and stifles competition.' [88] The pandemic also revealed the dependency of government agencies in Japan on paper-based processes.[90] A look into Japan's national policies and experiences with digitalisation sheds light on the complexities of the digital economy in which Japanese corporates participate.

Against this backdrop, findings from the desk research suggest that Japan's corporate sector has the greatest number of digital skills initiatives among the four countries of interest. Excluding initiatives implemented within Japan, 40 digital skills initiatives were either launched or executed by 19 Japanese corporates around the world. Of the 40 programs, 13 were implemented or are being implemented globally, regionally, or in multiple countries. 12 were based in Australia and Asian countries such as Malaysia, Vietnam, Singapore, India, and Indonesia. These 12 programs were initiated by AEON, Fujitsu, Central Japan Railway Company (JR Tokai), Toyota, Panasonic, Honda, Sumitomo Life, Fast Retailing Co., Ltd. (UNIQLO), Mitsubishi Development, Daikin, and Sony Pictures. On the other hand, 10 of the initiatives by Fujitsu, NTT Data, Hitachi, Bridgestone, and Nintendo were based in Europe, majority being in the United Kingdom. Five initiatives by Canon and Toyota covered the United Arab Emirates, Libya, Kenya, South Africa, and the African region. The remaining four

initiatives by Fujitsu, Panasonic, Softbank, and Sony Music were based in the Americas, particularly Brazil, the United States, and Canada. This shows that Japanese corporates had the widest geographical reach.

The focus of Japanese corporates' digital skills programs has been on education. Of the 40 programs, 21 targeted youth, students, or educators. Fujitsu initiated four programs related to education in the UK and North America. The company also partnered with an institution in the UK, The Responsible Business Network, on another program. These programs by Fujitsu ranged from implementing virtual workshops to developing a certification for educators. Similarly, NTT Data is equipped with a global portfolio of programs for educating children and youth with technical skills in a creative way. Play and Make It, Technology workshops, and Technology Olympics were some of the programs by NTT Data found in the desk research. In Asia-Pacific, there were programs focused on upskilling unemployed youth. For instance, Fast Retailing Co., Ltd. (UNIQLO) funded an International Labour Organization (ILO) project in Indonesia to develop e-training courses on technical skills, such as motion graphic and computer/IT networks, and soft skills for youth and job seekers. Honda initiated a similar project in India with Scooter India and ITI Delhi to equip local youth with technical skills and provide employment support. It is also worth noting that programs by Japanese corporates tended to focus on operational skills and strategic skills.

Another interesting feature of the Japanese corporate-initiated programs is that they funded research, scholarships, and leadership opportunities. For instance, Daikin offered a scholarship to Malaysian students for the first year of their university degree. The Toyota Foundation, on the other hand, regularly funds research, international, and special subject grants through their Grants Programs. The 2022 Research Grant Program awardees covered a broad range of categories, from child development to environmental sustainability.[91] Meanwhile, the Toshiba International Foundation created the Toshiba Youth Club Asia, where the youth can build connections and discuss 'world energy, sustainability, advanced technological solutions and others.'[92] In some cases, Japanese corporates entered into strategic partnerships with universities, similar to what has been observed with Indian corporates. For example, Mitsubishi Development entered into an agreement with the University of Queensland in Australia for mining engineering. Daikin established a Daikin Centre of Excellence at Manav Rachna University in India to engage students in air-conditioning technologies. This shows that these digital skilling initiatives by Japanese corporates go beyond the traditional programs that focus solely on upskilling. Overall, Japanese corporates sought to improve education and employment opportunities beyond the Asia-Pacific region.

South Korea: Expanding education and employment opportunities in Europe and beyond

South Korea is among the countries in Asia equipped with a robust digital economy and digital governance. Its digital industrial economy accounted for 41.3% of its industry value-added, ranking second after Germany with 41.8%.[93] It also ranked first out of the 29 Organisation for Economic Co-operation and Development (OECD) countries in the 2019 OECD Digital Government Index.[10] The country also surpassed other OECD countries in all six dimensions, such as digital by design, data-driven public sector, government as platform, open by default, user-driven, and proactiveness.[10] In terms of digital governance, the country developed the following innovations: the use of smartphones for government documents, plug-in free public websites, government virtual assistance services, and Public MyData, which promotes the data sovereignty of Korean citizens. Under the previous Moon administration, South Korea prioritised its digital economy as evidenced by the proposed 2.7 trillion won-investment its Digital New Deal in 2020.[11,12] In December 2022, the new administration under South Korean President Yoon Suk-yeol announced the 'New Growth Strategy 4.0' with technology as a key sector in implementing this strategy. [94] Around 25 trillion won will also be allotted to create an 'innovation growth fund' to support 'financing, talent fostering strategies and global cooperation.'[94] Similarly, the Government of South Korea released its Digital Government Masterplan, and among its aims is to attain an 80% digital conversion rate for key public services and a 100% cloud conversion rate for administrative and public institutions by 2025.[95,96]

The South Korean corporate sector played a crucial role in building its digital economy. For instance, Samsung, one of the most well-known electronics companies in the world, is proactive in the 'political life of the country and application of its economic power to establish public goals assisting to implementation of their private interests.'[97] Outside South Korea, Samsung is also heavily involved in the CSR space, and its initiatives were found to positively influence its overall reputation.[98] The South Korean Government's massive investment drive in information technology also paved the way for the creation of its digital content sector, which produces content ranging from television shows to video games.[99–101] For example, JTBC Content Hub, the content creation subsidiary of JTBC, signed a multi-year content distribution agreement with Netflix in 2019, which later led to the release of world-renowned Korean television shows on the streaming platform.[102] As Solovykh *et al.* state, 'When developing public economic interests, transnational corporations become a principal entity in terms of digital economy.'[97] This succinctly encapsulates the role of South Korean multinational corporates in the digital economy.

Building on this understanding, there were 33 initiatives by ten South Korean corporates found through desk research. More than half of these digital skilling programs, 20 of 33, were initiated by Samsung. Programs by Samsung ranged from digital classrooms, upskilling programs, and webinars. Three other programs, wherein Samsung was a partner, were headed by Vodafone, Plan International, and Vinschool Golden River. LG Electronics initiated two programs, the Global Ambassador Challenge and an in-house training program. The company was also a partner of the Korea International Cooperation Agency (KOICA) for a vocational program in Nigeria. KIA spearheaded an apprenticeship program and also became a KOICA partner. Two programs were also found to be initiated by KT Corporation. It had a unique initiative, an infectious diseases prevention system in partnership with the Ghanaian Ministry of Health and Welfare. Its second initiative was the Global Giga Story program which seeks to provide internet access to remove communities, and the Moheshkali Island in Bangladesh was the program's first recipient. Shinhan, Hyundai, Naver, and Doosan Babcock had one program each. Shinhan provided investment opportunities to start-ups and businesses in Indonesia, Vietnam, and South Korea. Hyundai implemented a design challenge in the UK called 'Innovators of the Future.' Naver launched a partnership with Hanoi University of Science and Technology and created an AI Research Center.

Digital skills initiatives of South Korean companies were concentrated in Europe, specifically the UK, and less than a quarter were available to the Asia-Pacific region excluding global programs. Meanwhile, the digital skills initiatives of the South Korean corporate sector in Vietnam outnumbered other Southeast Asian countries. Ten programs were implemented in the UK, with seven involving Samsung and one each involving Hyundai, Kia, and Doosan Babcock. Including other European countries and locations, the number of programs reaches 17, accounting for more than half of all programs by South Korean corporates. On the other hand, there were seven programs implemented in the African region, particularly South Africa, Nigeria, Morocco, Kenya, and Ghana. One of these programs, the Global Ambassador Challenge by LG Electronics, was also implemented in the Philippines. Seven digital skills initiatives were located in the Asia-Pacific region, specifically Australia, India, Indonesia, Thailand, and the Philippines. Lastly, two programs reached the Americas, Chile, Guatemala, El Salvador, Honduras, Nicaragua, Panama, Dominican Republic, and Ecuador.

Like Japan, there was an overwhelming focus on education, targeting youth, students, educators, and schools; however, apprenticeships and on-the-job experiences also stand out. For instance, Doosan Babcock, a construction engineering company, offered industry apprenticeship programmes for UK youth in welding, erecting/rigging, pipefitting, and project controls. A South Korean automobile manufacturer, Kia, implemented a similar apprenticeship program in the UK, wherein students can gain on-the-job experience in the automotive

industry. Likewise, Samsung had a 12-month apprenticeship program for graduating university students to work in sales, marketing, product management, customer experience, human resources, finance, sustainability & compliance, technical support, and product design. In 2021, LG Electronics provided in-house training to South African students on 'navigating LG's Commercial WebOS, remote control of LG's Digital Signage, Internet Protocol Television (IPTV) software, and how to properly install, set up and calibrate LG video wall technology.'[103] These programs initiated by South Korean companies generally tended to focus on strategic and operational skills. Furthermore, South Korean corporates provided digital education and employment opportunities in Europe and beyond.

3. Regional digital economy strategies of China, India, Japan, and South Korea and opportunities for digital skilling

China: Digital Silk Road for digital skilling

The Digital Silk Road (DSR) is Beijing's main strategic umbrella towards advancing China as a global competitor in digital technologies. The vision for DSR was announced in 2015, but it was not until 2017 at the first Belt and Road Forum for International Cooperation that the DSR was first coined.[51,104–106] As the technological component of the Belt and Road Initiative (BRI), Beijing seeks to create an 'information Silk Road' which involves 'build[ing] bilateral cross-border optical cable networks at a quicker pace, plan[ning] transcontinental submarine optical cable projects, and improv[ing] spatial (satellite) information passageways to expand information exchanges and cooperation.'[107] Beijing aims to strengthen cooperation with other countries under the BRI in areas of 'digital economy, artificial intelligence, nanotechnology, quantum computing, cloud computing and smart cities.'[106] The DSR covers a wide range of policy objectives: first, to address the demands of the ICT sector in China, second, to support the expansion of China's private sector and currency, and third, to facilitate 'inclusive globalisation' and 'internet sovereignty.'[106]

The Chinese private sector plays a three-pronged role in the realisation of the DSR, as resource providers, innovation drivers, and strategic contributors. As resource providers, Chinese corporates finance DSR projects. For instance, in the African region, Huawei and ZTE were recorded to have 49 and 22 loan-backed projects, respectively, from 2000 to 2018.[108] Exim, ZTE, and Huawei were the top financiers in Africa within the same period.[108] As Zhou and Xue (2020) state, 'Chinese technology companies have joined Chinese government efforts to shape regionwide standards, connect markets, and finance DSR projects.'[51] Inversely, private companies have opportunities to 'secure related funding as well as political and diplomatic support.'[109] They see the DSR as an opportunity to expand their operations and increase their profits.[51] Second, Chinese private companies also drive innovation under the DSR. Bike-sharing, digital wallets and mobile payments, and digital IDs are among these innovations.[110] These indigenously developed technologies also contribute to the expansion of Chinese presence in BRI countries. A third role of Chinese private companies is as contributors to the DSR strategy, and in turn, the BRI. For example, in Southeast Asia, Chinese technology companies support skills development in the region and build relationships with policymakers and professionals in the technology space.[51] Generally, expert opinions form a consensus that the privately owned companies in China contribute to the realisation of the DSR. It also highlights that the DSR is a domestic initiative inasmuch as it is a foreign policy strategy and that the private sector holds a symbiotic relationship with the state.[109,111]

Developments related to the DSR are transpiring alongside the growing geopolitical tensions between the US and China, which also heightens the technological competition between these two countries. Although China has achieved strides in its critical technologies, it has found it difficult to make a dent in Western-dominated systems, for instance, in standardisation and patent frameworks.[112] Despite this, some experts deem that China is making an impact in the developing world amid its strained relationship with the US. While the reception of DSR was mixed, certain economies welcomed the initiative. In 2020, Eurasia Group and Fudan University reported that 16 countries signed a memorandum of understanding with China under the Digital Silk Road.[104] Of these 16 countries, four are in Asia, namely, Bangladesh, Laos, and Turkey.[104] As Blanchette and Hillman state, 'China's tech champions are positioning themselves to win tomorrow's markets. In most of the world, U.S. warnings will continue to ring hollow in the absence of an offensive strategy that offers real alternatives.'[113]

The digital skills initiatives of Chinese corporates are aligned with the goals of the DSR. As stated previously, programs by Chinese corporates are largely based in the Southeast Asian region. Southeast Asia is becoming a highly contested space, considering the changing dynamics between major and emerging powers in the region. As China seeks to expand its presence in the region, opportunities arise for Chinese corporates to participate and contribute to the realisation of the DSR. Supporting and implementing digital skills initiatives in the region fosters people-to-people engagement and human development with partner countries. This thrust can create a unique impact beyond the common DSR projects that are largely focused on infrastructure and digital technologies. In addition, initiatives by Chinese companies in the Asia-Pacific region tend to focus on digital skilling for women and girls. This gender lens is beneficial in the context of Covid-19, where women were differentially impacted by the pandemic compared to their male counterparts. As mentioned in Chapter 1, women experienced challenges in seeking employment, doing carework, and accessing support. Overall, the already existing initiatives of Chinese companies may be integrated into the DSR.

India: 'Act East' digital diplomacy

India's 'Look East' strategy, more recently renamed 'Act East', reveals the broad strokes of its foreign policy in the Asia-Pacific region. India's eastward-focused foreign policy was introduced in early 1992 at the end of the Cold War with the aim of expanding India's relations in the Asia-Pacific region.[114] Indian Prime Minister Narendra Modi launched the 'Act East' policy in 2014 at the 12th ASEAN-India Summit to facilitate a more proactive partnership with Asia-Pacific countries, amid changing geopolitical dynamics in the region.[114,115] However, as Kesavan (2020) describes, ''Act East' and its early avatar, 'Look East' are not different; rather, they are two sides of the same coin, representing two different, but continuing phases in the evolution of India's policy towards the Asia-Pacific region.'[114] While India has not specifically

coined a term for its strategic engagements in the digital economy unlike China with its DSR, it has engaged with the Asia-Pacific region in digital infrastructure and technologies. In 2015, at the 13th ASEAN-India Summit, Indian Prime Minister Narendra Modi announced a US $1 billion line of credit that would enhance digital connectivity with the ASEAN region.[116] India is also setting up information technology training facilities in ASEAN countries at the cost of US $8.7 million and Centres of Excellence in Information Technology in Pacific Island countries, such as Fiji, Cook Islands, Nauru, Samoa and Niue.[116,117] When India assumed its G20 presidency in late 2022, it has placed an immense focus on 'building digital infrastructure, resilient supply chains, supporting digital skills, and addressing cybersecurity issues' to advance the global digital economy.[118] This relates to India's domestic success in becoming the first country to develop three foundational digital public infrastructures, 'digital identity […], real-time fast payment […] and a platform to safely share personal data.'[119] India's growing presence in the region, there remain areas for India to expand its engagements in digital trade and connectivity.[120,121] India also needs to enhance its economic and trade engagements as they are falling short compared to other Global South powers, such as China, Japan, and South Korea.[120,121] With its G20 presidency and its advanced public digital infrastructure, India has much potential to expand its engagements, while contributing to the global economy and Covid-19 recovery.

The previously limited involvement of Indian corporates in India's foreign policy has shifted. Beyond the country's resilient industries, the software and digital sectors, India's private sector initially had minimal agency in developing its country's foreign policy.[122] More recently, the Indian private sector has been fostering international engagements in two ways. First is through independent private sector partnerships, with the aim of creating business opportunities and increasing access to capital. For instance, Tech Mahindra entered a partnership with American-German company Celonis in February 2023 to 'assist clients in optimizing their business processes to accelerate transformation, reduce cost and boost the bottom line.'[123] On 25 October 2022, Tata Consultancy Services announced its partnership with Ellucian, a higher education technology solutions provider headquartered in the United States, to ramp up digital transformation for higher education.[124] Second, the Indian private sector engages in investments informed and incentivised by India's foreign policy priorities. For example, the Modi government has been focusing its diplomacy efforts to advance India's startup ecosystem. In 2021, Prime Minister Modi has 'incorporated the startup community as a key focus of the bilateral talks with other nations, with a particular focus on the government's prominent policy endeavors, such as Make in India, Skill India, Smart Cities and Digital India, etc.'[125] Another evidence of this is India's engagements with Latin America. External Affairs Minister Dr. S. Jaishankar reported that 'Indian IT services companies now employ more than

100,000 Latin Americans.'[126] There are also 27 Indian pharmaceutical companies operating with 72 of their subsidiaries in the Latin American region. These developments demonstrate the emerging role of India's private sector in advancing regional geopolitical and economic interests.[126] India's private sector also plays a crucial role in leading outward foreign direct investments (FDI) and attracting inward FDI into the country. As India's economy and international influence expanded, India's private sector, including Indian MNCs, 'became a mouthpiece for India' in the multilateral arena.[127] Private sector industries and academic institutions in India also contribute roughly 40% of Indian research and development expenditure.[128] India's corporate sector is now shaping into a critical partner of the Indian government, and it is able to contribute to its implementation in distinct ways.

While India's regional strategy in relation to the digital economy is less straightforward than China's, India is an exemplar of soft power and a leader in regional governance, and these capabilities can be applied in the context of digital diplomacy. Historically, India has played a crucial role in multilateralism and regional governance, for instance, in the General Agreement on Tariffs and Trade, the United Nations Conference on Trade and Development, the Non-Alignment Movement, and the Treaty on the Non-Proliferation of Nuclear Weapons.[129,130] More recently, India has been actively participating in the Quadrilateral Security Dialogue or Quad with Australia, Japan, and the United States, Brazil, Russia, India, China and South Africa or BRICS, and the Indian Ocean Rim Association with 22 other neighbouring states.[131] In the Quad, for instance, India has taken a proactive role in advancing technology cooperation with its three partner countries.[132] Beyond participation, India has been creating its multilateral institutions. For example, the International Solar Alliance is a partnership between India and France, which is also seen as an institutional tool to potentially advance India's geopolitical interests and, in turn, counter the BRI.[133,134] Although India still has work to do to maximise its role in regional governance, it is an expert at wielding its soft power or the ability of 'getting others to want what you want', unlike hard or military power.[135] India has exercised its cultural diplomacy in the Asia-Pacific region and beyond.[136–138]

India's 'Act East' policy, soft power capabilities and regional governance experience pave the way for India's 'Act East' digital diplomacy. While there is no universal definition of digital diplomacy, it can be loosely defined as a set of diplomatic activities that are enabled or amplified by digital technologies to support a state's foreign policy objectives and foster interaction with foreign institutions or publics.[139,140] Adesina argues, 'Digital diplomacy and Internet activities as a whole can greatly assist in projecting a state's foreign policy positions to domestic and foreign audiences.'[140] As with the case of China, it is important to highlight that digital technologies, in the context of diplomacy, should go beyond infrastructure

development and internet-based diplomatic engagements. With the experience of India's indigenous private companies, India's digital diplomacy can include digital skilling.

The strategic approach of India's corporate sector, therefore, presents an opportunity to advance and concretise its digital economy strategy in the Asia-Pacific region and to expand the role of India's private sector in its foreign policy. As shown in the previous chapter, Indian corporates drive strategic, often long-term and wide-ranging, partnerships with universities, institutions, and other corporates in the region. These initiatives place Indian companies in a unique and strong position to foster partnerships between the Government of India, particularly through its foreign policy strategies in the digital economy, and their partners in the Asia-Pacific region. Indian corporates can also help inform the creation of India's digital economy strategy based on the lessons learned from implementing their digital skills initiatives. There is also a pressing need for the Quad to ramp up its technology cooperation, particularly in critical and emerging technologies.[132] Indian companies can play a proactive role in facilitating these dialogues among Quad-member countries. Moreover, India's corporate sector can act as a link between India and Asia-Pacific.

Japan: Free, open, and digital Indo-Pacific

First introduced by former Japanese Prime Minister Shinzo Abe in 2016, Japan's foreign policy is geared towards achieving a 'Free and Open Indo Pacific' or FOIP.[141] According to Japan's Ministry of Foreign Affairs, there are three pillars towards realising a FOIP: 1) 'Promotion and establishment of the rule of law, freedom of navigation, free trade, etc.', 2) 'Pursuit of economic prosperity', and 3) 'Commitment for peace and stability.'[142] Since the inception of the FOIP framework, Japan has developed multilateral and bilateral connections in the region. For instance, Japan signed a US $2.5 billion ODA in 2019 to enhance its connectivity with Bangladesh.[143] While the FOIP is more of a vision instead of a strategy compared to how it was originally defined, experts debate where China sits in Japan's FOIP vision.[144,145] Scott (2019) argues that it is a strategy to expand Japan's Indo-Pacific presence and consecutively, 'tacitly and implicitly restrain' China's presence in the Indo-Pacific.[146] On the other hand, Sahashi (n.d.) states, '[…] the FOIP vision shall continue to emphasize inclusiveness with China while also stressing collective rule-making and compliance with international rules and norms.' Japan's political stance in the context of the FOIP remains unclear and so is the concrete position of digital technology cooperation in this vision. With Japan's changes in leadership over the past three years, now with Prime Minister Fumio Kishida, it will be interesting to see how the FOIP vision evolves.

Over the years, Japan's private sector has contributed to advancing Japan's foreign policy, through private investments, for instance, overseas infrastructure projects. Japan's

infrastructure exports predate that of the BRI and former Prime Minister Abe's infrastructure push in Asia. Some of these initiatives were formed under the Ministry of International Trade and Industry's 1987 New AID plan, and other programmes were initiated by the Asian Development Bank.[147] Despite this, Japan is faced with strong competition from industrialised countries in these infrastructure contracts.[148] This has also prompted the Japanese government to be involved in these investments.[148] For example, Japan ultimately lost to China in a bidding to build a 140-km highspeed railway between Jakarta and Bandung.[148] Competition with China is unavoidable, as Japan seeks to cement itself as the top infrastructure exporter in Asia. However, cooperation with China under the BRI is not impossible. According to Nanwani (2019), 'In December 2017, the Japanese government informed private sector companies that it would actively push cooperation between business sectors of Japan and China in third countries, including Asian countries, with the cooperating infrastructure including environmental protection projects, industrial modernization projects, and transport and logistics projects.'[149]

In addition, the private sector supports Japan's public diplomacy efforts. Japanese businesses facilitate people-to-people exchanges through public-private partnerships.[150,151] For instance, the New Tohoku program invited businesses, students, and influencers from overseas to learn more about Japanese culture.[151] More broadly, the Cool Japan Fund Inc, which sought to fund the international promotion of Japan's cultural products, was launched in 2013 from the government and private sector funding amounting to US $523 million as of 2016.[99,152] These collaborations highlight the importance of the private sector in public diplomacy.

The Japanese private sector's experience in infrastructure exports and public diplomacy can be incorporated in the digital skilling space. While digital technologies were not explicitly stated in Japan's FOIP vision, they play a critical role in its engagement with other major players in the region, for instance, with Australia, India, and the US through the Quad. Desk research revealed that Japan's corporate sector has the most extensive portfolio of digital skills initiatives. While the majority of these initiatives were still in the Asia-Pacific region, Japanese corporates were highly visible in Europe, Africa, and the Americas. This not only highlights the importance of digital skilling in Japanese companies' CSR strategies but also the strong presence of Japanese companies worldwide. These already existing programs can be further maximised by integrating them into Japan's FOIP vision, particularly in relation to the digital economy.

South Korea: Global cooperation networks for digital skilling

In May 2022, South Korean President Yoon Suk-yeol's team put forward his vision for South Korea's new foreign and security policy based on a 'confident diplomacy and strong national

security.'[153] Part of the country's new diplomacy strategy is to reinvigorate South Korea's ties with the US, Japan, China, and Russia. Seoul also aims to 'Build a "Global Cooperation Network" Tailored to Each Region' according to an unofficial translation by NK News.[154] This includes enhancing South Korea's relations with the ASEAN region through the 'ABCD strategy' through 'advancing human capital, building health security, connecting culture and digitizing Asian infrastructure.'[154,155] Digital trade was also mentioned in this policy document as a means of contributing to South Korea's economic security. Although the 'confident diplomacy and strong national security' strategy is still in its preliminary stages, digital infrastructure, technologies, and trade will play a role in creating these global cooperation networks.

Like Japan, the South Korean private sector contributes to its government's diplomacy endeavours through advancing cultural diplomacy, facilitating economic linkages, and investing in science, technology, and infrastructure. South Korea, again similar to Japan, is one of the strongest soft powers in Asia. First, the worldwide reach of Korean pop culture was a private-sector success inasmuch as it was a public-sector win. Private sector initiatives worked well with the government's role in advancing the country's cultural and creative sectors and digital technologies.[156] According to Lee (2022), 'The South Korean government has a unilateral policy to promote the Korean Wave but it has increasingly drawn on expanding private sector resources, as it seeks to decentralize its cultural diplomacy efforts.'[157]

Second, the private sector has been a main driver of South Korea's economic ties in Asia, but South Korea's public and private sectors are inextricably linked in these economic relations. In the 1980s, when South Korea's economy was rapidly expanding, its private sector poured investments into the Southeast Asian region to reduce labour costs.[158] This also had geopolitical implications. Song and Kim (2022) state that Southeast Asia was 'a niche market for South Korean companies that were undergoing trade conflict with developed countries.'[158] Similarly, in the late 2010s, Korea's New Southern Policy, former South Korean President Moon Jae-in's foreign policy paradigm, saw to the diversification of Korea's economic activities due to its perceived overdependence on China.[149] While economic security is of concern, private companies still see economic efficiency as their utmost priority.[149] This means that South Korea's focus, whether public or private, on Asia-Pacific is not new. It is also worth noting that the country's economic activity in Southeast Asia is 'heavily skewed towards a single partner', Vietnam.[159] For instance, Samsung accounted for 20% of Vietnam's total exports and, in 2018, 28% of Vietnam's GDP.[160] Meanwhile, almost a third of Samsung's global revenues were from Vietnam.[160] This aligns with the desk research finding that digital skills initiatives of the South Korean corporate sector in Vietnam outnumbered other Southeast Asian countries. The role of private sector has become more evident under the Yoon

administration. In December 2022, the Korean government released the framework for its '2023 Economic Policy Directions', and among its key foci are 'boosting the economy that puts the private sector at its core.'[94]

Third, the South Korean private sector plays a crucial role in science, technology, and infrastructure development. As with South Korea's economic linkages, public-private endeavours dovetail. Locally, South Korea's e-government infrastructure was a successful and innovative collaboration between the government and the private sector.[161] The private sector was a 'major force for improving national capability' as the government began implementing its digitalisation and technology policies.[162] As South Korea became a leader in digital technologies, the country began to shift its official development assistance (ODA) policy into digital transformation and private sector engagement.[162] For instance, at an OECD Development Assistance Committee (DAC) high-level meeting in 2020, South Korea's Ministry of Foreign Affairs discussed the use of data sharing and artificial intelligence as part of the country's Covid-19 mitigation efforts.[162] This again highlights that the public and private sectors are interconnected in their development initiatives. Turner *et al*. (2022) state, referring to the development of South Korea's e-government infrastructure and ICT leadership, 'While the private sector is responsible for most of the ICT development, the government has consistently provided direction and support for a phenomenon that originated under the developmental state but has continued into recent times.'[161]

The range of digital skills initiatives by South Korean companies presents a unique window of opportunity to integrate the South Korean private sector into the Yoon administration's vision for global cooperation networks. As mentioned earlier, the country's private sector has since been a driver of economic cooperation between South Korea and countries in Asia-Pacific, particularly Southeast Asia. However, as found in the desk research, less than a quarter of digital skills initiatives were available to the Asia-Pacific region. A significant proportion of these initiatives were concentrated in Europe, specifically the UK. The needs of the Asia-Pacific region and the Yoon administration's newly minted ASEAN strategy offer an opening for the private sector. South Korean companies can not only expand these digital skills initiatives in the region but also integrate themselves into South Korea's foreign policy initiatives, particularly through these global cooperation networks.

4. Conclusion: Paving the way forward for multi-sector cooperation in digital skilling

The Covid-19 pandemic and rapid digitalisation emphasised the urgent demand for digital skilling in the Asia-Pacific region, particularly for marginalised groups. Public and private sector institutions have been implementing a range of digital skilling programs to address this need. Given this demand, these programs are often similar, with overlapping objectives and content. Some programs also tend to target similar audiences. While the wide selection of programs is beneficial to the Asia-Pacific population, it is important to streamline these public and private sector efforts and highlight areas for international collaboration where corporates can proactively participate.

Within this context, this research addresses these knowledge gaps by mapping out Chinese, Indian, Japanese, and South Korean corporate initiatives and examining the regional strategies of each of these four countries. Digital skills initiatives by Chinese corporates tended to focus on enhancing digital skills of women and girls. Indian corporates undertook a strategic approach in their digital skilling initiatives, seeking longer-term and broader partnerships. While focusing on education, Japan's corporate sector has the greatest number of digital skills initiatives and the broadest geographical scope among the four countries of interest. Digital skills initiatives of South Korean companies were concentrated in Europe and, in Southeast Asia, mainly Vietnam. They focused on education, targeting youth, students, educators, and schools.

The analysis of the regional strategies of China, India, Japan, and South Korea underlined the opportunity to expand these initiatives in the Asia-Pacific region and integrate them into their foreign policy strategies. The goals of Beijing's DSR can be supported by Chinese corporates through people-to-people engagement and human development with partner countries through these digital skills initiatives. As for India, its corporate sector's strategic approach can operationalise its 'Act East' strategy through digital diplomacy. Indian companies, therefore, hold a unique role in facilitating partnerships between the Government of India and its counterparts in the Asia-Pacific region. Japan's corporate sector, on the other hand, is equipped with extensive experience in infrastructure exports and public diplomacy. With Japan's FOIP vision in mind, these already existing initiatives by Japanese companies can be maximised by expanding into Asia-Pacific. Lastly, the Yoon administration's newly minted ASEAN strategy presents a window of opportunity for the private sector to drive the creation of global cooperation networks in the context of the digital economy. Korea's private sector has long been a bridge between South Korea and Asia-Pacific, particularly Southeast Asia, towards economic cooperation. It is, therefore, worth emphasising that corporate-driven digital

skills initiatives can contribute to the regional digital economy strategies of their respective countries.

Infrastructure is often the primary focus when it comes to the digital economy. As institutions pour resources into digital infrastructure, upskilling people to be able to use, adapt, and maximise these digital technologies is as critical. Zhou and Xue (2020) state, in the context of the DSR and BRI, that there must be a shift from 'hardware' to 'human-ware.'[163] This also applies to the three other countries of interest. It is essential not to discount the importance of digital infrastructure, but skills development should be perceived with equal importance. Populations from partner or recipient countries can be proactive partners in the process, which begins with these digital skills initiatives.

This research has shown the range of digital skilling expertise of Chinese, Indian, Japanese, and South Korean corporates in relation to their home country's respective foreign policies. Increased collaboration and deeper dialogue between the public and private sectors can improve digital skilling opportunities for the Asia-Pacific region. The research also found that these initiatives tended to focus on operational and strategic skills. However, there is an opportunity to expand the scope of these digital skilling initiatives. With Asia-Pacific becoming more at risk from the impacts of false information, enhancing the scope of existing or future initiatives to cover information skills will benefit communities in the region by equipping them with the tools and abilities to counter false information.[164] Furthermore, there is much opportunity to support and enhance the digital skilling capabilities of the region through multi-sector cooperation.

The Asia Foundation's Future Skills Alliance

The challenge

Economic recovery in Asia and the Pacific post-Covid-19 will require businesses, governments, and nonprofit organizations to collaborate to future-proof and re-skill people for new opportunities in the digital economy. Together with rapid digitalization and changes in the job market, Covid-19 created a "double disruption" for workers across the region, with women, youth, and other marginalized groups disproportionally impacted. Female entrepreneurs in the micro, small, and medium enterprises (MSME) sector—who already faced challenges such as limited access to funding, lack of networks and expertise, and gender biases—saw their livelihoods disrupted. Women's jobs are 1.8 times more vulnerable than men's, and up to 220 million young workers' jobs are at risk across the region.

The Future Skills Alliance

In response to this challenge, The Asia Foundation has launched the Future Skills Alliance (FSA), a broad coalition of partners from both the public and private sectors working together to deliver future skills at scale to the region's hard-to-reach communities. The FSA creates a pathway for businesses to contribute to environmental, social, and governance efforts across Asia and the Pacific. By investing their unique assets in a collective impact model, all partners contribute to driving impact at a regional scale. For more information, visit https://futureskillsalliance.org.

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Appendix

Appendix 1. Digital skills initiatives by Chinese companies

Initiating Institution, Donor, or Funder	Name of Initiative	Location	Description	Other Partners	Target Audience	Year Announced
Alibaba	Netpreneur Training	Philippines, Indonesia, and the African region	Trains digital entrepreneurs and business owners to help them use digital technology to grow business and local economy		Entrepreneurs and business owners	
Alibaba	Global E-commerce (GET) Talent Training Program	Malaysia	Trains local SMEs and entrepreneurs in order to make them digitally capable	Government of Malaysia and local professional institutions and universities	SMEs	2022
Ant Foundation (Ant Group)	Together Digital	China and Indonesia	Aims help narrow the gender gap in access to digital technology, and to support the digital empowerment of women.	UNDP	Women entrepreneurs	2022
Huawei	No information	Malaysia	'Involves the cross-sharing of expertise via workshops, seminar and trainings, as well as collaborations with market leaders and experts in the field to provide relevant insights for women on latest trends and innovations with the advent of advanced technologies'	Women Leadership Foundation	Female leaders and digital talents	2021
Huawei	Indonesia Women in Cybersecurity (IWCS)	Indonesia	Aims to increase women's and girls' awareness of cybersecurity through various activities and technical assistance	National Cyber and Encryption Agency (BSSN)	Girls and women	2021
Huawei	Digital Training Bus: Empowering Women in Rural Bangladesh	Bangladesh	Gives rural female access to digital skill training and technology	Government of Bangladesh (ICT Division) and Robi Axiata	Rural women and girls	2017
Huawei	Bridging the Education Gap in Bangladesh	Bangladesh	Provides local children whose education has been suspended due to COVID-19 with Huawei tablets	Bijoy Digital (a local private company) and UNESCO	School-aged children	2020
Huawei	Seeds for the Future Program	Asia-Pacific Region (16 countries)	Aims to develop ICT talent through their annual program. Offers an opportunity to local youth to 'propose technical solutions to social problems' through the cross-cultural, digital bootcamp	ASEAN Foundation	Youth	2008
Lazada Foundation (Alibaba Group)	No information	Southeast Asia	Provide opportunities for youths, narrow down gender digital gap, and create positive impacts among communities	TBD	Women and youths	
The Indonesian Parliamentary Women's Caucus (KPP-RI)	Support Digital Technology Learning among Female Lawmakers	Indonesia	Seeks to enhance women legislators' digital skills and awareness in cybersecurity and cyberbullying so that they can better serve the community they represent	Huawei	Female lawmakers	2021
TikTok	Tackle digital gap and youth unemployment	UK	Offers participants up to four weeks on an employability course and get a career coach, virtual work experience, mental health support, access to a bursary and mentoring	Catch22	People who are not currently in education, employment and training and who are aged between 16 and 24 are being targeted in the scheme	2022

Appendix 2. Digital skills initiatives by Indian companies

Initiating Institution, Donor, or Funder	Name of Initiative	Location	Description	Other Partners	Target Audience	Year Announced
Byju's	Byju's Future School	US, UK, Australia, Brazil, Indonesia and Mexico	'An online education technology platform that offers both private — one student to one dedicated teacher - — online, personalized classes, as well as close group online classes with one dedicated teacher to four students.' 'Our proprietary, research-based curriculums include coding for students grade 1-12, music for students grades 1-12, and math for students grade 1-8 with additional advanced math classes in development. Courses in science and fine arts are scheduled to launch soon.'		Students	2022
Cloudnine hospitals	Online maternity programs in India	Australia	'Tamworth-based Birth Beat has formed a partnership agreement with Bengaluru-based Cloudnine hospitals to promote its online maternity training programs in India. Cloudnine has 19 hospitals and clinics in Bengaluru, Chennai, Gurugram, Pune, Mumbai and Chandigarh. Birth Beat connected to Cloudnine through participation in the NSW Government's Going Global Export Program, Health and Medtech to India.	Birth Beat NSW Government		2022
HCL Technologies	Strengthening HCL's Quantum computing capabilities	Australia	Aims to 'strengthen HCL's Quantum computing capabilities through education and development opportunities including internships for Australia-based students from Sydney Quantum Academy member universities'	Sydney Quantum Academy (Macquarie University, UNSW Sydney, the University of Sydney and University of Technology Sydney, supported by NSW Government)		2022
InfoSys	InfoSys Springboard Pathfinders Online Institute Digital Academy Reskill and Restart	USA	'Includes content across the digital learning, maker education, and professional life skills continuum. The integrated digital skills program includes three lifelong learning offerings: 'Educating the Future', 'Upskilling Today' and 'Reskilling for Tomorrow' – meeting all learners where they are on their digital journey, irrespective of background or educational development.'	Harvard Business Publishing	10,000,000 educators, students, and aspiring professionals by 2025	2022
InfoSys	GovHack	Australia and New Zealand	A two-day hack event held across Australia and New Zealand where participants are given 46 hours to create concepts, mashups, and models with open government data			2020
InfoSys	Digital Innovation Partnership	Australia	'[...] Infosys and Tennis Australia will focus on using technology for good with a vision to enhance accessibility, learnability and inclusivity on and beyond the court. The five-year collaboration starts with enhancing the Tennis Australia Leadership programs, to engage and empower the leaders of tomorrow to help make positive change in their communities.'	Tennis Australia		2022
Kosmoderma Healthcare Private Limited	Three-month trial program		'Sydney-based life sciences company and participant in the NSW Government's Going Global Export Program Health and Medtech to India SkinDNA, has entered a three-month trial program with Indian skin clinic chain Kosmoderma Healthcare Private Limited which operates seven clinics across Bengaluru and Chennai.'	SkinDNA		2022
Mach33.aero	Collaboration agreement	Australia	'NSW deep technology incubator and operator of the National Space Industry Hub located within Sydney's Tech Central, Cicada Innovations and Bengaluru-based Mach33.aero have signed a collaboration agreement to provide launch pad support to startups and medium sized enterprises from the two geographies operating in deep technology.'	Cicada Innovations NSW Government	Startups	2022

Motherson	Child education initiatives	Americas	'Education across various age groups is given prime importance is this continent. In USA this includes donations to high schools, supporting local youth cadet programmes, funding the robotics team in schools and also providing financial assistance to schools for stocking their supplies. In Mexico the organisation supports both high schools and kindergarten schools with donations and providing supplies.		Students	2019
Motherson	Apprenticeship programmes	Americas	Works with local universities and colleagues to open opportunities for young people and their careers		Students	2019
Tata Consultancy Services	goIT program, TCS Digital Garage, Senior Lab student volunteer program, and SHINESeniors	Singapore	'Will provide internships, training and learning opportunities for ITE staff and students and [...] will also engage and involve ITE students holistically in community care solutions for senior citizens […]'	Institute of Technical Education (ITE) in Singapore	ITE staff and students, senior citizens	2022
Tata Consultancy Services	TechFutures Teachers: Careers Resources Pack	United Kingdom	'Bringing together industry insights, practical lesson guides and activities, The TechFutures materials are designed to address this deficit. Teachers are provided with lesson plans, example job descriptions and group exercises to help educate students about the variety of industries that require digital skills, the different types of career paths available within IT and the steps that can be taken to pursue them.'	The Tech Partnership and MyKindaCrowd	Teachers	2015
Tata Consultancy Services	Closing the Skills Gap		'TCS' commitment to retrain 1.2 million people is focused on three fronts; upskilling and reskilling its current workforce, preparing today's students for 21st century careers, and empowering women, ethnic minorities and marginalized groups.'	World Economic Forum	1,200,000 million people	2019
Tata Consultancy Services	No information	Australia	'The new partnership brings together Deakin's academic excellence and TCS' extensive industry networks and experience. The first program, to be piloted in early 2022, will focus on machine learning, which consists of three streams enabling senior executives, mid-management and practitioners to leverage the power of this emerging technology in their chosen profession. Each stream will be facilitated by leading academics and industry experts. The programs are designed to address specific capability gaps for businesses and will provide learners with an engaging experience that goes to the heart of the skills and knowledge required in these dynamic fields.'	DeakinCo. (division of Deakin University)	Businesses and learners	2022
Tata Consultancy Services	TCS Internship Programme	United Kingdom	'The UK has welcomed the launch of a scheme that will see 1,000 British graduates boost their digital skills through paid internships with Tata Consultancy Services, calling the programme a perfect fit for wider collaboration with India.'	Government of India, Government of the UK	1,000 British graduates	2016
Tata Consultancy Services	TCS Sydney Digital Garage	Australia	'The advanced research hub is designed to holistically look at innovation, helping businesses establish their competitive differentiation, increase speed to market, and navigate their growth and transformation journeys. It provides companies with a structured framework that helps them ideate better, work on creative solutions faster, and focus their efforts on real, purpose-driven business needs.'	NSW Government		2022
Tata Consultancy Services Malaysia	Hiring initiative and Initial Learning Program	Malaysia	Aims to 'fill the digital skills gap and generate lucrative tech jobs for the youth of the country' and implement a 'two-month long learning and hands-on training programme' for new graduates	Government of Malaysia, Ministry of Human Resources	Job seekers	2021
Tech Mahindra	Memorandum of Understanding with the Government of Bangladesh	Bangladesh	Aims to ' foster the growth of digital startup ecosystem in Bangladesh, by providing guidance and mentoring to the budding entrepreneurs' 'As part of the comprehensive growth framework outlined within the MoU, Tech Mahindra will be assisting new-age technology startups in the country, focusing on future technologies like Artificial Intelligence, 5G, Big Data, Cybersecurity, Blockchain, Internet of Things (IoT) and Machine Learning, to leverage digital growth opportunities across its global network.'	Government of Bangladesh, Startup Bangladesh	Startups	2019

Tech Mahindra	Memorandum of Understanding with the Digital Economy Promotion Agency under the Ministry of Digital Economy and Society of Thailand	Thailand	Seeks to 'accelerate digital transformation in Thailand' '[…] both organizations will co-develop innovative digital solutions and execute commercially viable projects and use cases for enterprises in areas of IoT, AI, 5G, Analytics, Blockchain, and Metaverse for various industries including Smart Cities, Telecom, among others.'	Digital Economy Promotion Agency under the Ministry of Digital Economy and Society of Thailand		2022
Wipro	Digital Innovation Hub	Germany	'The proposed Digital Innovation Hub will serve as Wipro's flagship centre in Europe and will offer digital transformation expertise to companies in Germany, enable organisations to cross skill and upskill besides supporting talent development in local communities. Wipro will also collaborate with institutions and universities in the North Rhine-Westphalia state to develop tailored programs and career opportunities for young graduates in advanced digital skills and technologies.'		Organisations, institutions, and universities	2020

Appendix 3. Digital skills initiatives by Japanese companies

Initiating Institution, Donor, or Funder	Name of Initiative	Location	Description	Other Partners	Target Audience	Year Announced
AEON	Pupuk@AEON programme	Malaysia	Aims to empower micro SMEs through digitisation methods Opens up AEON's 'existing ecosystem to provide business development opportunities to micro enterprises'	Malaysian Communications and Multimedia Commission	100 micro small-medium enterprises	
Bridgestone	Mobility Hackathon	Italy	Offers students the opportunity to gain experience, visibility and to promote digital skills in Big Data and Mobility fields'		Students	
Canon	Young People Programme, Live the Story	UK	Promotes photography and digital storytelling. Created a 'toolkit that gives young people the skills to create visual stories that can change the world'	Ideas Foundation, National Association for Teaching English	Youth	2020
Canon	Partnership agreement	United Arab Emirates	Delivers on the ambitions of the UAE's Vision 2021 to develop the talent of youth in the UAE by empowering them to engage new-age digital innovations and prepare them with the skills required for education and employment opportunities of the future'	Ministry of Education	Youth	
Canon	Frontiers of Innovation	Africa	Creates a platform for 'industry and sector experts under one online platform, discussing evolving trends, pandemic impacts, and exploring how sectors prepare for the post-COVID-19 phase'			2021
Canon	Libyan Woman and Youth Civil Society Organisations at the Forefront of Entrepreneurship, Innovation and Technology	Libya	Supports Libyan women and youth with digital and technological skills	UN Women	12 Libyan women	2022
Canon	Miraisha Sustainability Programme	Kenya	Seeks to increase capacity of people in African countries through imaging workshops and seminars for aspiring photographers and filmmakers 'Falls under Canon's corporate philosophy of `Kyosei,' meaning 'living and working together for the common good,' which allows the company to continue its strong growth in the region with new business initiatives while also promoting impactful CSR activities'			2019
Central Japan Railway Company (JR Tokai)	Training partnership	Vietnam	Trains engineers in the use of Japanese high-speed rail technology	Vietnam Railway Corporation (VRC)	100 officials and engineers	2009
Daikin	Daikin Centre of Excellence	India	Establishes a 'Daikin Centre of Excellence' at the Manav Rachna University Ensures 'hands-on practical exposure for the students and help them acquire the new technologies being practiced in the air-conditioning industry including the VRV technology, R-32 refrigerant and inverter technology'	Manav Rachna University	Students	2018
Daikin	Scholarship Program	Malaysia	Offers a 'scholarship to eligible students who have already gained acceptance into Malaysian Public or Private Universities pursuing their 1st-year degree programme'		Students	
Fast Retailing Co., Ltd. (UNIQLO)	Soft Skills E-training for Youth and Job Seekers	Indonesia	Aims to 'promote and pilot digital skills and distance learning, and generate synergies between skills development and other labour market policies' through two e-training courses on motion graphic and computer/IT network for the Ministry of Manpower (MoM) and soft skills	International Labour Organization	Youth	2021
Fujitsu	Global Strategic Partner Academy Program	Global	Offers 'training, re-training and experience-based development opportunities' to 'employees, apprentices and new recruits' Aims to create a 'global community of digital specialists to help its customers navigate challenges in their sector and in society'	ServiceNow, SAP, and Microsoft	Employees, apprentices and new recruits	2021

Fujitsu	First Nations-led skills program	Australia	Aims to boost digital skills of the Cherbourg community through a 'three-year pilot program to provide ethnic community members on-the-job training and employment opportunities'	Queensland Government, Cherbourg Aboriginal Shire Council, Queensland Department of Innovation, Tourism & Sport and TAFE Queensland	Aboriginal and Torres Strait Islander communities	2022
Fujitsu	Fujitsu Education Ambassador Program	United States and Canada	Promotes education-wide collaboration through a series of events in K-12 schools Invites experts who will demonstrate new technologies and provides Professional Development credits to participants		Educators	
Fujitsu	Operation Innovation	UK	Implements 4- to 6-week virtual workshops for students to 'gain an understanding of Robotics and AI and business skills'		Students	2017
Fujitsu	Fujitsu Innovation Hub	UK UTC Reading Edinburgh College Brunel University London Borders College Block H on Bletchley Park UWS Paisley South Devon College	Seeks to 'support staff, students, schools and the community in the use of technology and the development of digital skills' Offers a 'modern, technology-enhanced space for the development of challenge-based learning and digital-related skills'	Intel, Brocade and Kyocera (South Devon College)	Educators, students, and schools	
Fujitsu	Fujitsu CoDE (Certificate of Digital Excellence)	UK	Launches a digital qualification for teachers or the Certificate of Digital Excellence which aims to develop their tech skills Consists of six modules: Internet of Things (IoT) Virtual Reality (VR) / Augmented Reality (AR) Cyber Security Data Analytics and Big Data Programming / Coding / Robotics Artificial Intelligence (AI) / Cognitive Computing		Educators	2019
Fujitsu	Partnership agreement	Global	Establishes a partnership with KDDI in 'creating new services that enrich the customer experience and contribute to the resolution of social issues by utilising Fujitsu's private 5G and KDDI's au 5G technologies, with the aim of realising a new digital society and co-creating businesses based on 5G'	KDDI		2021
Hitachi	IoT curriculum development and training	France	Creates a new IoT curriculum at Polytech Orleans which consists of a 7-month training program	Orléans Métropole and the University of Orléans	Masters students and employees	2019
Hitachi	Social Innovation	Global	Series of events, hackathons, and roundtables on social innovation			
Honda	Skills Enhancement Centre	India	Aims to equip local youth with technical skills and provide employment support	Scooter India and ITI Delhi	Youth	2022
Mitsubishi Development	Partnership agreement	Australia	Establishes a partnership agreement between Mitsubishi Development (MDP) and The University of Queensland which involves the creation of a Future Mining Systems Initiative Director position 'to drive the expansion of technology education in mining engineering, while endeavouring to increase Australia's supply of skilled mining professionals'	University of Queensland		2021

Nintendo	Digital Schoolhouse programme	UK	Aims to implement 'play-based learning combining creativity, fun, innovation and education' Conducts a tournament called Digital Schoolhouse Super Smash Bros. Ultimate Team Battle with Nintendo Switch engages students with 'practical and soft skills with participation in professional esports roles, crafted by the video games industry for education'	Digital Schoolhouse	32,000 students	2019
NTT Data	Tech Academy initiative	UK	Is open to everyone, 'We are not looking for participants to have any prior qualifications – that's what the Academy is for' Combines digital and face-to-face teaching from specialists and creates groups where participants can collaborate on hands-on projects towards their certifications			2022
NTT Data	route2work Digital Skills Academy	UK	NTT Data UK's first group of sponsored candidates has graduated from the route2work digital skills academy programme. As part of its DoDiversity campaign, the IT services provider funded scholarships for 30 women to enrol in one of four digital skills academies to learn core Microsoft skills.		30 women	2021
NTT Data	Play and Make it	Global	Aims to 'reduce the digital gap by encouraging computational thinking, stimulating creativity and bringing children and young people closer to programming and technology, not only as consumers but also as creators' Includes: • Technology and programming workshops that stimulate creativity and teamwork. • Free online courses, available to children, parents, trainers and schools. • Technology Olympiads, which encourage critical thinking, discipline, resilience and problem-solving skills through programming and technology.		4,500+ children 400+ families 850+ volunteers	
NTT Data	Technology workshops	Global	Includes a series of seminars, camps and talks where children are introduced to programming through applications and programmes like Scatch, Tinkercad and App Inventor Creates an opportunity for students to 'design their own robots, applications and video games'		Children	
NTT Data	Technology Olympics	Global	Implements a three-month program where participants can 'acquire digital skills and computational thinking abilities' Enables participants to 'create and design video games, stories and animations in a very fun and original way'		Children and youth (7 to 16 years old)	
Panasonic	CareerEx and XcelIT	India	Seeks to upskill college and university students in Data Science, Cloud Computing, Machine Learning/AI and Internet of Things, among other topics 'CareerEx course starts at Rs 9999 per month onwards while, XcelIT starts at Rs 999 per month however, students can avail individual tests at Rs 99 too'			2020
Panasonic	STEM Forward	US	Aims to inspire students in the fields of EdTech and STEM Education and features Katie Ledecky is a 3-time Olympian, 15-time World Champion, and 10-time Olympic medal-winning swimmer. 'Connects students in grades 3-8 to the game-changing power of technology with standards-aligned resources for any learning environment at no cost'	Discovery Education	Children and youth (Grades 3 to 8)	2022
Softbank	Data Science for All (DS4A)	US and Latin America	Trains senior artificial intelligence ("AI") and data science talent and develops a training and assessment platform to upskill workers in the adoption of AI		10,000 people from underrepresented communities	2021
Sony Music	Digital Accelerator Program	Brazil	'Awards three projects that harness artificial intelligence and machine learning, including helping people with hearing disabilities enjoy music'			2020

Sony Pictures	Future Jobs Finder	Global including India	Introduces young people to Vodafone's free Future Jobs Finder, a gamified digital platform to help them understand their skills and future career opportunities' 'This skilling programme is live in India and aims to empower youth as they embrace the digital transformation and chart a digital career.'	Vodafone	10,000,000 youth	2018
Sumitomo Life Insurance (Sumitomo Life)	Digital Talent Accelerator	Singapore	Seeks to support persons with disabilities by providing digital career training through an 11-week intensive accelerator program	Temasek Polytechnic (TP)	30 persons with disabilities	2021
The Responsible Business Network	Business in the Community NI's 'Time To' series	UK	Equips youth with 'valuable transferable and digital skills for the future' Seeks to 'ignite students' interest in ICT and give them a better of understanding of its benefits and uses'	Fujitsu	Youth	
Toshiba International Foundation	Toshiba Youth Club Asia (TYCA)	Global/Asia-Pacific March: Cambodia, Laos, Myanmar, Philippines, Vietnam, Thailand, Japan December: Brunei, Indonesia, Malaysia, Singapore, Thailand, Japan	Creates a network of young Asian leaders aimed at 'building and strengthening peace and harmony in the Asia-Pacific region' Opens an opportunity for participants to discuss the following topics: 'world energy, sustainability, advanced technological solutions and others'	ASJA International, ASCOJA	Youth High school students	2021
Toyota	Grants	Australia	Provided a $60,000 grant from the Toyota Community Trust to Makers Empire Helps 'deliver 3D technology and professional learning to eight schools in Melbourne's West' 'The West Melbourne 3D Printing in Schools Project is designed to develop sustainable and scalable models of professional learning that lead to effective implementation of STEM learning outcomes and improvement in students' critical, creative and Design Thinking abilities'	Makers Empire		2021
Toyota	Toyota Project	South Africa	Places unemployed youth in affiliated schools through one-year work experience program Aims to 'upskill the youth with relevant skills, matched to the digitized world of work, by using globally recognized platforms such as Cisco, LinkedIn & OpenWHO'	ORT SA, YES (Youth Employment Services)	Unemployed youth	
Toyota	Mobilmo	Global	Allows children to create '3D Mobilmo contraptions to explore the imaginary planet Cosmobi'		Children	2017
Toyota	Grants Programs	Global	Includes Research Grants, International Grants, Special Subject Grant			2012

Appendix 4. Digital skills initiatives by South Korean companies

Initiating Institution, Donor, or Funder	Name of Initiative	Location	Description	Other Partners	Target Audience	Year Announced
Doosan Babcock of the Doosan Group	Apprenticeships	UK	Offers industry apprenticeship programmes for the youth in Welding, Erecting / Rigging, Pipefitting and Project Controls		Youth	2021
Hyundai	Innovators of the Future	UK	Invites UK design students 'to harness their design genius and create a future Sports Utility Vehicle interior'		Design students	2017
Kia	Apprenticeships	UK	'Deliver[s] younger people with experience, expertise and hands-on tuition within the automotive industry while also enabling them to earn as they learn'		Youth	
Korea International Cooperation Agency (KOICA)	Vocational Programs	Nigeria	Trains Nigerian students on vocational skills and provides them with work experience and internship opportunities Covers the following topics: 'entrepreneurial and digital skills, marketing, logistics and business administration'	KIA and LG Electronics	Students	2021
KT Corporation	Global Giga Story program	Bangladesh	'Provides a giga-class Internet service to remote islanders around the world for free'		Remote communities Schools	2017
KT Corporation	Infectious Diseases Prevention System	Ghana	Launches partnership with Ghanaian Ministry Health and Welfare in Accra, Ghana to 'build a system to prevent the spread of infectious diseases using big data'	Ghanaian Ministry Health and Welfare		2018
LG Electronics	Global Ambassador Challenge	South Africa Philippines	Seeks to support local initiatives	Korea Friends of Hope International	Local community initiatives	
LG Electronics	No information	South Africa	'Provid[es] in-house training to help more people gain access to the relevant knowledge and technical skills needed in today's electronic display industry' 'Includes navigating LG's Commercial WebOS, remote control of LG's Digital Signage, Internet Protocol Television (IPTV) software, and how to properly install, set up and calibrate LG video wall technology' 'Provides training for African students for future careers that will rely on cutting-edge technologies such as 3D printing, virtual and augmented reality, telecommunications, Internet of Things (IoT), robotics, data science, and cybersecurity'	Forge Academy	Students	2021
Naver	AI research center	Vietnam	Launches a partnership with Hanoi University of Science and Technology, aiming to ramp up artifificial intelligence in Vietnam Is part of Naver's Global AI R&D Belt initiative in 2019	Hanoi University of Science and Technology		2019
Plan International	Smart Schools	Guatemala, El Salvador, Honduras, Nicaragua, Panama, Dominican Republic and Ecuador	Aims to impart digital skills to students in public schools lacking resources	Samsung	Students	
Samsung	Digital Classroom	UK	Aims to 'encourage the development of digital skills from an early age by enabling access to vital technology for some of the most disadvantaged learners in the UK' Provides classroom technology and support in 15 primary schools		3,000 students teachers	2014
Samsung	Digital Discovery Centre	UK	Provides digital activities for schools and families, including interactive workshops and sessions		35,000 students	2009
Samsung	Work Wonders campaign	UK	'A new platform which showcases the vibrancy and variety of modern UK businesses [and] is designed to help businesses of all sizes get the confidence they need to take it all the way in this new era of hyper-flexible working and new workplace norms'		Businesses	2021
Samsung	No information	Germany, Italy, Spain, UK and Sweden	'Equip[s] schools, colleges and museums with 3D printers as part of Samsung's digital skills programme so that students at any grade level can both code and create' Engages students in the 'full design cycle' by combining classes on design and coding with 3D printing	MakerBot	Students	2016
Samsung	Digital Academy	Global	Provides 16 – 24 year olds with access to 'smart technology, ICT training and employability programmes to help their transition from education to employment'		16-24 year olds	

Samsung	Smart Classroom	Europe	Transfers digital skills, like coding, to teachers and students through 1,300 Smart Classrooms in 20 European countries		6-16 year olds	
Samsung	Solve for Tomorrow	US Australia India	'Is an annual contest challenging 6th-12th graders to solve local issues using science, technology, engineering, arts and math.		6th to 12th graders	
Samsung	Samsung Innovation Center or Innovation Campus	Thailand Indonesia Vietnam Chile Armenia	Aims to upskill young people through coding and programming training	Junior Achieving Foundation of Thailand and Thai-Nichi Institute of Technology	Youth	
Samsung	The Grassroots Academy	UK	'Provide[s] local community support for local teams by helping five clubs to learn vital creative and digital skills through Samsung technology, elevating their clubs' brand and content, amplified through Samsung channels'	The Elephant Room	Football clubs	2022
Samsung	Samsung Digital & Offline Skills Training (DOST)	India	Seeks to train 50,000 youth to become job-ready for the electronics retail sector through nationwide skilling centres	NSDC	50,000 youth	2021
Samsung	Samsung Innovation Camp	Italy	Trains students from Italian universities in the digital field with employment opportunities	Randstad	Students	2021
Samsung	Samsung UK Apprenticeship Programme	UK	'Offer[s] successful applicants the opportunity to 'earn and learn' by providing a direct route into the world of work, while having the opportunity to achieve a fully funded qualification in their chosen field at the same time' Includes on-the-job training and a development programme, with salary and benefits		University students	2022
Samsung	Future-Innovation Lab	South Africa	Offers a 6-month training on software development, digital social innovation, and transferrable skills Opens opportunities for entering into the industry	University of the Western Cape Microsoft AppFactory	18-35 year olds	2020
Samsung	Let's Make Samsung Technology Come to You	Morocco	Provided more than 1,000 Samsung tablets with educational materials into100 Education trolleys	Morocco's Ministry of Education	100 schools	2017
Samsung	Solar Powered Internet School	Kenya	Seeks to 'increase the standard of education irrespective of the public schools' ability to provide of learning material, electricity connectivity and ICT' 'Is a 40-foot shipping container that Samsung furnishes with 24 Samsung Laptops plus one for the teacher, a multi-purpose Samsung printer, a 50 inch electronic board, a server, internet access and the solar panels' 'All [these] devices are optimized for the use in solar –powered environment at a total cost of 12.9 million ($146,997)'		Schools	2014
Samsung	Generation 17	Global	Aims to 'mobilize global communities, educate people about the urgency of the Global Goals and build impactful and inclusive solutions that help promote prosperity while protecting the planet by 2030'	United Nations Development Programme	Youth	
Samsung	#Pledge2Youth	European Union	Involves BIK Youth Ambassadors 'working alongside industry members of the Alliance to better protect minors online to consider and run a design challenge, focusing on an aspect of age-appropriate design or data privacy, exploring innovative ways to give children and young people a space to express their views and ensure their voice is listened to and acted upon'	European Commission	Youth	2020
Samsung	Samsung Sessions	Netherlands	Seeks to improve the digital and social skills of youth through gaming Offers an intensive programme using Minecraft and Roblox	H20 Esports Campus	350 youth	
Samsung	LetsApp	Italy	Is an application or digital platform aiming to engage students in three activities, 'learning, practicing, and playing' Provides modules on app development, digital marketing, and presentation skills and includes the 'no coding required' App Inventor 2 tool developed by MIT. 'Gives students real hands-on experience of developing an app in team – and presenting the results to their peers'		30,000 registered students, 23,000 participant students and 5,500 LetsApp graduations, with 560 projects	2018
Samsung	Student's Digital IQ	Estonia Latvia Lithuania	Seeks to impart knowledge on cybersecurity and appropriate online behavior to young people and opens a venue for students to discuss netiquette		Estonian, Latvian and Lithuanian students	2020

Shinhan	Shinhan Future's Lab	Indonesia Vietnam South Korea	'Support[s] & provide[s] a variety of investment opportunities and support to attract investment from about Korean and Global VC partners'		Start-ups or businesses	
Vinschool Golden River	No information	Vietnam	Seeks to improve learning and teaching through education technology and Chromebooks equipped with Chrome Education Upgrade	Samsung Google	90 students 15 teachers	2022
Vodafone	business.connected program	UK	Samsung, as the exclusive smartphone partner, provides hardware and software products for small businesses 'to improve performance, strengthen security and stay connected'	Samsung Enterprise Nation	150,000 small businesses	2021