Chapter 6

Digital Divide and the Platform Economy: Looking for the Connection from the Asian Experience

Francis Mark Quimba, Maureen Ane Rosellon, and Sylwyn Calizo Jr.[1]

6.1. Introduction

In 2019, 5.2 billion people (62.0% of the global population) subscribed to mobile services (UNCTAD 2019).[2] Mobile technologies and services, including digital platforms, generated about $4.1 trillion of economic value added or about 4.7% of global gross domestic product (GDP), and countries continue to reap the benefits resulting from the greater productivity and efficiency of mobile services. Indeed, the GSM Association (GSMA)—an organization that represents the interests of mobile operators worldwide—projected that the economic value of mobile services will increase to 4.9% of world GDP by 2024 (GSMA 2020), suggesting the foundation for the platform economy is strengthening.

However, large segments of the population are unable to benefit from the platform economy, partly because of the digital divide, thus creating a *platform divide*. The digital divide is defined as "the gap between individuals, households, businesses, and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICT) and to their use of the internet for a wide variety of activities" (OECD 2001).

[1] Senior research fellow, supervising research specialist, and research specialist, respectively, from the Philippine Institute for Development Studies.

[2] This chapter was prepared as a background paper for ADB (2021) and draws from Quimba, Rosellon, and Calizo (2020).

The rapid growth and value of digital platforms has been observed in Asia (Google, Temasek, and Bain 2019), with the United States (US) hosting the majority of the 70 highest-valued digital platforms. However, benefits may not be uniformly distributed across and within countries in the region. A number of studies (Fraiberger and Sundararajan 2015; CUTS International 2018a and 2019; Quimba and Calizo 2018) show that digital platforms reduce inequality by spreading opportunity and providing income to people at the bottom of the income distribution. Meanwhile, other studies reveal that digital platforms, as part of the sharing economy,[3] may be contributing to the increase in inequality (Schneider 2014; Schor 2014). This prompted the Asia-Pacific Economic Cooperation (APEC) in 2017 to launch its Internet and Digital Economy Road Map (APEC 2017, 6) for APEC economies to "bridge the digital divides between and within economies, regions, and groups," and in particular to "ensure that digital strategies incorporate a gender perspective that addresses women's needs and circumstances" to "bridge the digital gender divide."

This chapter looks at the pattern of digital divides in Asia and relates this to participation in digital platforms, seeking answers to the following research questions:

i. How does the digital divide affect the platform economy?
ii. How can the platform economy affect existing divides (not necessarily digital)?

The chapter describes Asia's experience to try to understand how the digital divide is affecting the various cultures and economies in the region and vice versa. It attempts to explain the link between the level of digital access and the participation in the platform economy, hopefully providing sufficient bases for policy reforms to narrow the digital and platform divides. The chapter begins with an extensive look at the platform economy and the digital divide, its important concepts and case examples from Asian economies. The chapter concludes with policy recommendations.

[3] The sharing economy refers to businesses that focus on the sharing of underutilized assets, monetized or not, in ways that improve efficiency, sustainability, and community (Rinne 2017). Examples are the popular accommodations giant Airbnb and the multimodal transport platform Grab.

6.2. Platform Economy and Digital Divide

The definition of digital platform used here follows UN Conference on Trade and Development (UNCTAD) (2019) description of the digital platform landscape to cover as many types as possible, including both nonprofit-oriented and profit-oriented digital platforms.[4] The discussion will include examples (Box 6.1) from various subcategories of profit-oriented digital platforms such as electronic payments, e-commerce platforms, and services e-commerce platforms (e-health, tourism, digital labor). This allows the chapter to use as case examples the performance of specific platforms in certain countries.

Box 6.1: Examples of Digital Platforms

Accommodation platforms operate an online community marketplace for suppliers to list, and users to discover, and book accommodations whether online or through a mobile phone. Airbnb is such a platform and provides the means of communication and mediates interaction and sometimes payment between the supplier landlord and the user guest. Airbnb is an accommodation platform that provides users lower search costs, access to alternative modes of accommodation, and additional benefits such as sustainable and conscious consumption and even sources of travel information (Pins n.d.).

Remote work platforms provide a venue for freelancers to gather and cater to a broad range of clients (e.g., business owners, start-ups, and entrepreneurs, among others). An example of such work platforms would be Upwork (Fulltime Nomad 2017) which posts jobs under 12 major sections: (i) web, mobile, and software development; (ii) IT and networking; (iii) data science and analytics; (iv) engineering and architecture; (v) design and creative; (vi) writing; (vii) translation; (viii) legal; (ix) administrative support; (x) customer service; (xi) sales and marketing; and (xii) accounting and consulting.

Digital finance refers to "financial services delivered through mobile phones, personal computers, and the internet or cards linked to a reliable digital payment system" (Ozili 2018, 330). Examples would be Alipay and GCash.

Digital health platforms were brought about by the "disruptive technologies that provide digital and objective data accessible to both caregivers and patients leading to an equal level of doctor-patient relationship with shared decision-making" (Mesko et al. 2017). Related to digital health is mobile health (mHealth), which is the use of mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants and wireless devices, for medical and public health practice.

E-learning refers to the use of information and communication technology to support learning and/or deliver education, either in a synchronous (when the lessons are carried out in real-time) or asynchronous format (pre-recorded and the learners progress at their own pace.) Virtual classrooms are examples of synchronous e-learning while

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[4] A more extensive discussion on the definition of digital platforms is found in Chapter 2 of this volume.

Box 6.1 *continued*

the massive open online courses are examples of asynchronous e-learning. Another evolution of e-learning is mobile learning, which is defined as "any sort of learning that happens when the learner is not in a fixed, pre-determined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies" (Ko et al. 2015). The set of online services that allows community of learners and facilitators to interact, have access to information, tools, and resources for the delivery and management of teaching and learning activities is called the e-learning platform. There are two types of e-learning platforms: the learning management system, i.e., platforms that enable the provision of e-learning courses, and the learning content management system, which directly manages the contents.

Sources: Fulltime Nomad (2017); Ko et al. (2015); Mesko et al. (2017); Ozili (2018); and Pins (n.d.).

A platform mapping by UNCTAD (2019) indicates that the top global digital platforms are highly concentrated geographically, particularly in the US and the People's Republic of China (PRC) (Figure 6.1). GSMA (2020) data for Asia and the Pacific show that while mobile broadband coverage is already at 94.0% on average, half of those covered choose not to use the internet. As noted, the benefits of the platform economy are not equitably distributed within and across countries, owing to differences in levels of income, education, gender, and geographical location.

Figure 6.1: Distribution of Main Global Platforms by Region, 2018

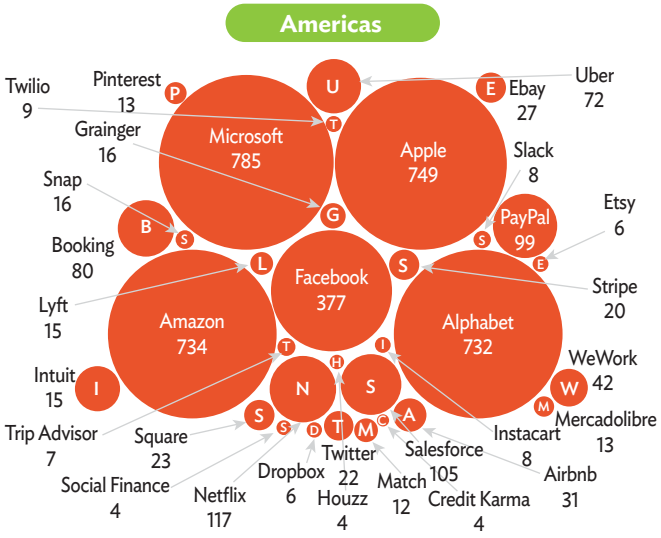

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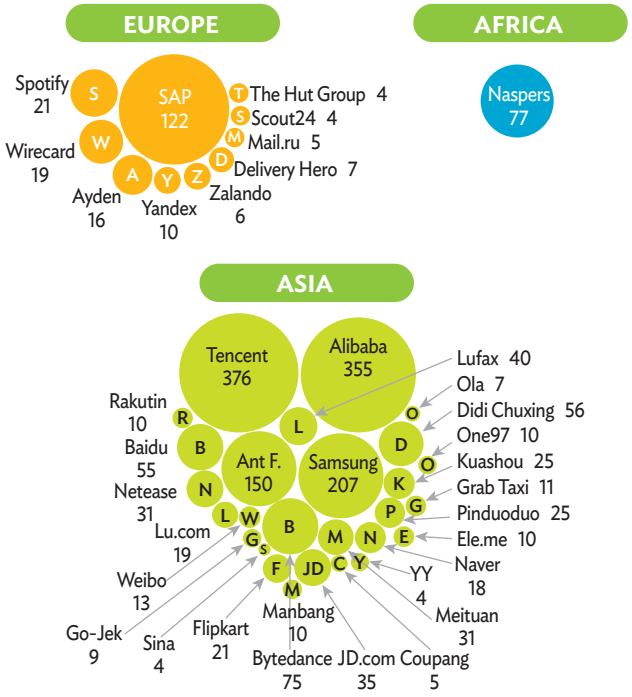
Figure 6.1 *continued*

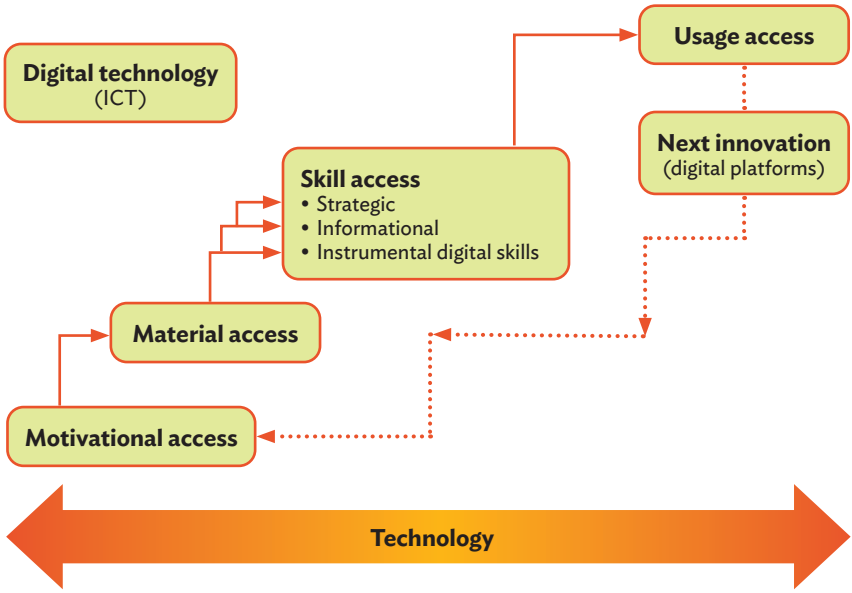


Source: UN Conference on Trade and Development (2019).

Cumulative and Recursive Model of Digital Divide

As a means of explaining the relationship between digital divide and the platform economy, this chapter slightly modified van Dijk's (2006) cumulative and recursive model (Figure 6.2). This model extends the basic concept of access—understood as *material access* or the counting of people with computers or access to internet connections—to include *motivational access, skills access,* and *usage access*.

Figure 6.2: Cumulative and Recursive Model of Successive Kinds of Access to Digital Technologies



ICT = information and communication technology.
Note: The figure is a slightly modified version of Figure 1 in van Dijk (2006).
Source: Authors, based on van Dijk (2006).

Van Dijk (2006) distinguishes four kinds of barriers to access (divides), corresponding to each of the four types of access. One, the *motivational or mental access divide* is pushed by the lack of elementary digital experience, fear of technology, and a perceived intimidation from new technology.

Two, the *material access divide* includes barriers that limit physical access to a computer or a mobile phone, and network connection. This would also include the cost of internet subscriptions and mobile phone accounts.

Three, the *skills access divide* is related to the user's capability to maximize benefits from ICT. Skills access involves three types of skills: operational skills or knowing how to operate hardware and software; informational skills necessary to navigate and process information; and strategic skills (van Deursen and van Dijk 2011; Ghobadi and Ghobadi 2013) or how to use ICT for personal and societal development. Skills access can

be constrained by insufficient digital skills caused by unfamiliarity with technologies, inadequate education, or lack of social support. Ghobadi and Ghobadi (2013) point out that low income and education and lack of time to learn new things are critical factors in all three types of skills.

Four, *usage access divide* is about how individuals actually utilize ICT which is affected by their demographic characteristics (e.g., social class, education, age, gender, and ethnicity) and the quality of their digital infrastructure (e.g., reliability of internet connection). Usage access divide is also manifested in users' active and passive use of ICT—the former is about publication of creative content in various platforms, whereas the latter refers to the consumption of creative content.

The first three types of access follow a relatively linear order of precedence—the skills needed to participate in the platform economy are dependent on the motivation to learn and the physical access to basic technology. It is only when people have acquired the necessary skills can they participate in the platform economy.

Van Dijk's (2006) model suggests that when a technology is fully appropriated, a new innovation arises and the entire process repeats. Usage access enables people to maximize the use of the technology which may lead to innovations. Usage opportunities are enhanced in the discovery and use of more complex applications and innovations, such as the platform economy.

Digital platforms, for example, are a value addition to access to computers, internet, and digital technology. In reality, it would be nearly impossible to discuss digital platforms separately from ICT and the ICT sector. The digital sector, as the core of the digital economy, is consistent with the representation of the digital economy used by Bukht and Heeks (2017) and cited by UNCTAD (2017).

Underpinning the platform economy are the IT/ICT sectors or the foundation of the digital economy. Thus, the digital divide can be seen as a determinant of the use of digital platforms, as material and skills access affects how digital platforms will be used and maximized. Moreover, the inherent nature of some digital platforms inadvertently creates or exacerbates digital divides, as active involvement is preconditioned on the presence of the motivation, materials, and skills, precluding participation of those who lack these.

Figure 6.2 also depicts that any new product or innovation faces the same types of access and limitations. As a new product or service, a platform would have to break the motivational barriers preventing access. Some factors would be specific to the platform itself, such as trust in the platform, perception of the ease of use, room for personal innovation, and task characteristics. The limited availability of certain applications on specific mobile operating systems can hinder material access. For instance, if the platform is only accessible through Apple's iOS, then those using Android mobile phones would automatically be excluded.[5]

Knowledge of mobile applications or digital platforms also affects their use. For some individuals and businesses, learning to use the platform may be too costly in time and money, among other things. Effective usage of platforms would also be affected by policy and infrastructure.

Certain segments of the population have better access to computers and the internet.

The following indicators portray the existing digital divide in Asia. This could be manifested in a global divide (across countries) or in a social divide (within countries).

Motivational access

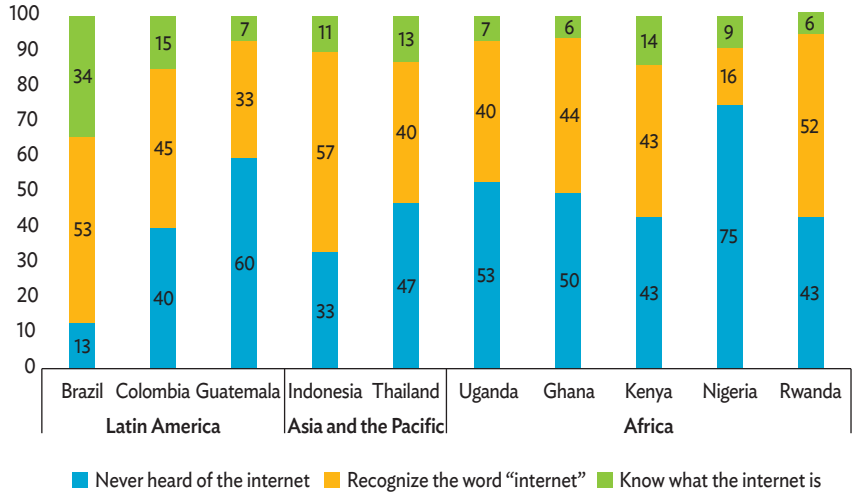
Motivational access refers to the desire to have a computer or a mobile phone and to be connected to the internet. This desire is affected by social, cultural, or psychological factors.

Trust and perception of the internet

One of the main barriers to access is the lack of knowledge about the internet. In a survey of selected economies from 2014 to 2015 as examined by Wu et al. (2016), it is found that over two-thirds of those currently offline did not know what the internet is (Figure 6.3). Only 13% of the offline population in Thailand and 11% in Indonesia knew what the internet is.

[5] Android and Apple's iOS are mobile operating systems widely used in the industry. However, iOS is used exclusively by Apple while Android is developed and used by multiple parties, such as Google and the Open Handset Alliance.

Figure 6.3: Awareness and Understanding of the Internet Among Non-Users, 2014–2015
(% of non-internet users)

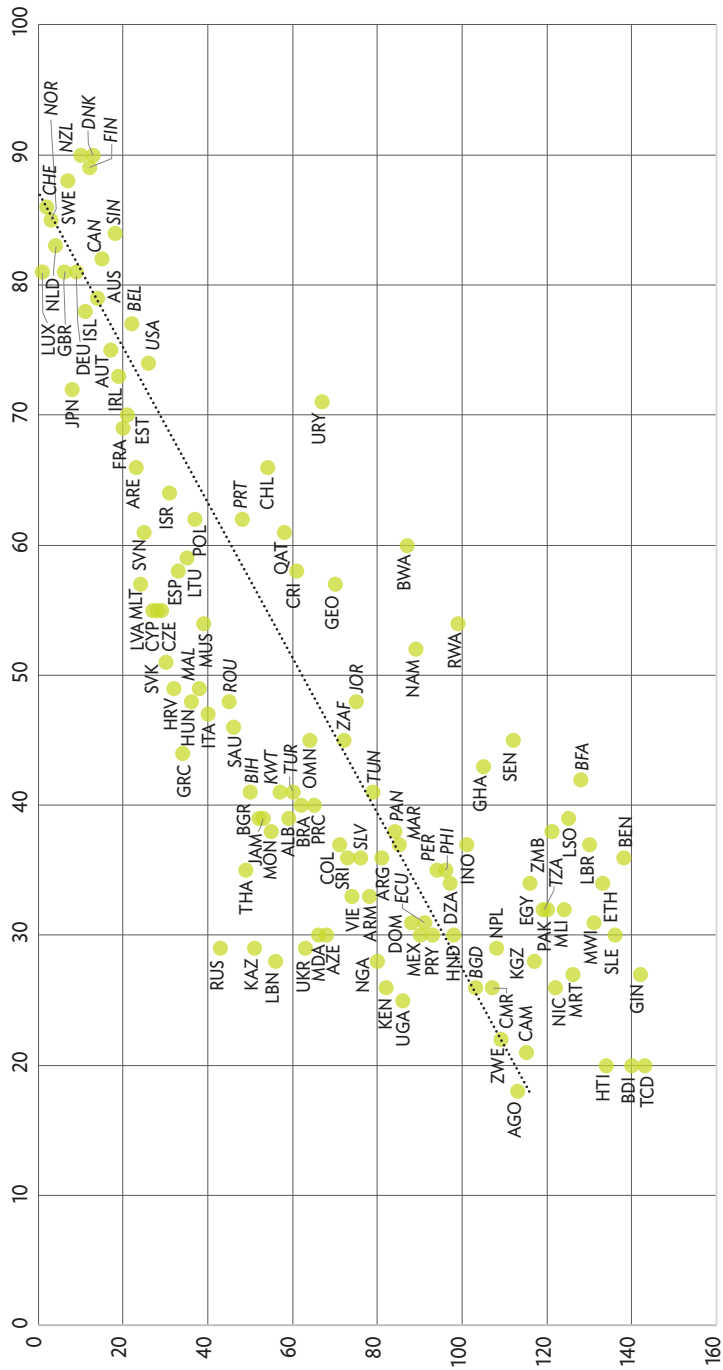


Source: Wu et al. (2016).

Perception and trust affect the motivation to use digital technology and participate in the platform economy. The presence or perception of corruption in the business environment tends to breed distrust in policy governance and e-commerce transactions. As the platform economy is largely associated with digital transactions and e-commerce, high levels of corruption would dissuade participation in the platform economy.

Countries with low incidence of corruption (e.g., Israel, Japan, Singapore, and Switzerland) are associated with higher rates of e-commerce, while countries that rank lowest in e-commerce index also have high incidence of corruption (Figure 6.4). Similarly, UNCTAD (2017) posits that low propensity for online shopping among developing countries may reflect lack of trust in the online environment, limited awareness of e-commerce, and cultural preferences.

Figure 6.4: Corruption and E-Commerce, 2017



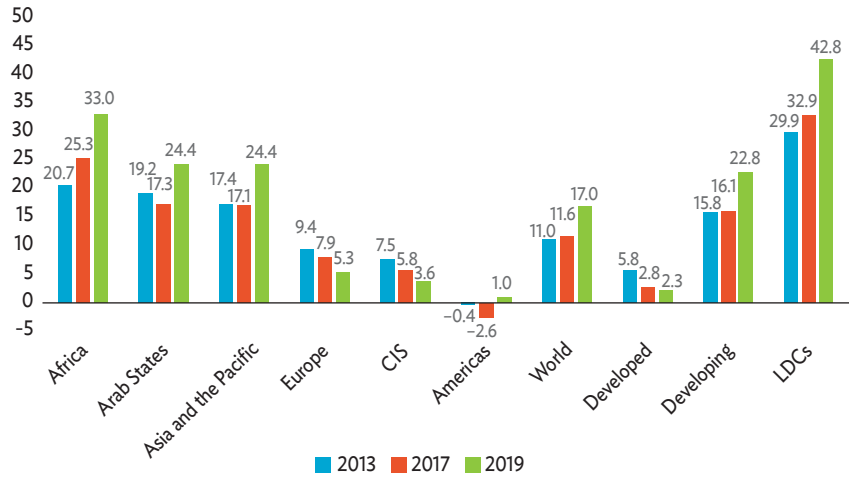
Note: Country labels are placed to the left of their data point, but some country labels (italicized) are placed to the right of their data point to improve chart readability.
Source: Authors' calculations, based on World Bank TCdata360 (accessed July 2020).

Gender Divide

UNCTAD (2019) reports that in about two-thirds of countries worldwide, there are more male internet users than females (Figure 6.5). It is only in the Americas that the proportion of women using the internet is higher than of men.

The gap between male and female internet user penetration rates is on average about 22.8% in developing countries and 2.3% in developed countries. The bigger gaps are observed in least developed countries, at 42.8%, and Africa, at 33.0%. The gap widened from 2013 to 2019. Noticeably, a large increase in the global gender gap occurred in just 2 years, from 11.6% in 2017 to 17.0% in 2019.

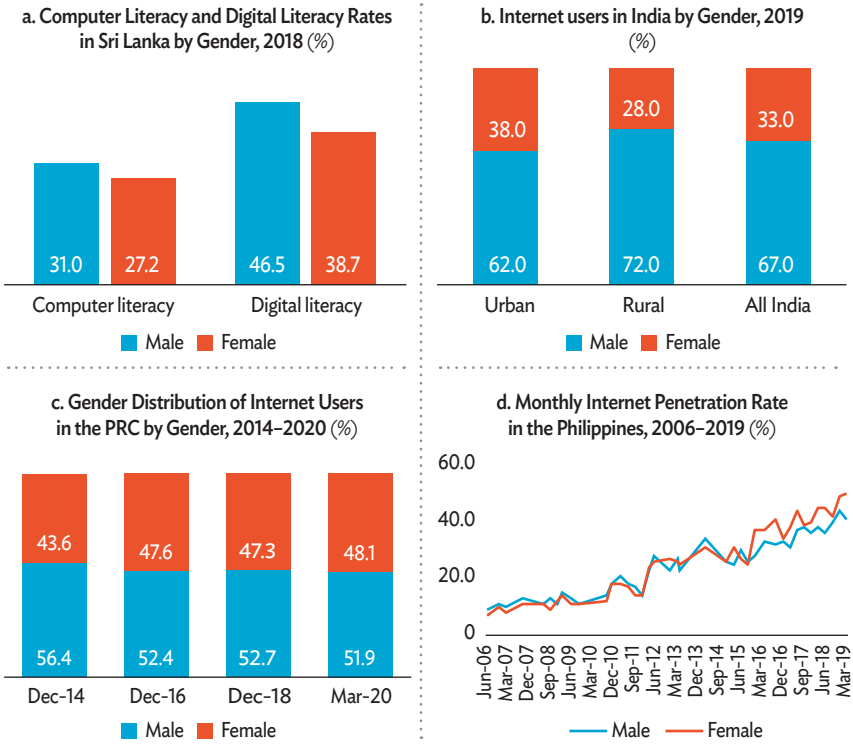
Figure 6.5: Internet User Gender Gap
(%)



CIS = Commonwealth of Independent States, LDC = least developed country.
Note: The gender gap represents the difference between internet user penetration rates for males and females relative to the internet user penetration rate for males, expressed as a percentage. The country groupings are based on the definitions of the source.
Source: International Telecommunication Union (2017, 2019).

Data for a number of economies also show that males have better ICT access than females (Figure 6.6). Moreover, data for Sri Lanka show that females have lower computer and digital literacy than males. In Viet Nam, the proportion of males (82.0%) using the internet for personal use is significantly

Figure 6.6: Indicators of ICT Access in Selected Asian Economies by Gender



ICT = information and communication technology, PRC = People's Republic of China.
Note: The data for the PRC; the Philippines; and Taipei,China are obtained from Statista (accessed July 2020). The ultimate data sources are indicated below.
Sources: Ecomobi (2017); Government of the People's Republic of China, China Internet Information Center (2020a); Government of Sri Lanka, Department of Census and Statistics (2018); and Government of Taipei,China, National Development Council (2019).

higher than of females (73.0%). In Taipei,China, access to internet at home via paid services (e.g., mobile 3G or 4G internet, fixed broadband internet, and fixed broadband with router) is lower for females. It is only in the Philippines where the data shows that females have better access to the internet. Junio (2019) finds that there is a gender divide in digital financial services. In Japan, males tend to participate more in online shopping than females (Figure 6.7).

Various reasons for the gender disparity in access to the internet and participation in the digital economy include physical access and socio-cultural characteristics of women, interest, and ability. Sey, Kang, and Junio (2019) explain how culture, interest, and ability affect women's access to the internet and participation in the digital economy. Lack of useful content for women also affects their use.

In a survey done by Gillwald, Galpaya, and Aguero (2019), they find that despite internet services being relatively affordable in Bangladesh and Pakistan, women could not afford to be connected due to their low income and lack of skills. For women online, this lack of skills leaves them vulnerable to privacy and safety threats, while social and cultural norms and attitudes prevent them from maximizing their use of the internet.

However, economy-level data also show breakthroughs in the participation of women in digital technology. In Taipei,China, more women use online banking and mobile payments than men. In the PRC, e-commerce activity is higher for women than men. Females have better access to e-learning than males in the Philippines and in Viet Nam. This is consistent with the findings of the United Nations University (Junio 2019) that there were breakthroughs in access of females to digital technology.

Figure 6.7: Gender Divide in ICT Use by Selected Asian Economies

HS = high school, PRC = People's Republic of China, ROK = Republic of Korea.
Note: The data for Indonesia; Japan; (the) PRC; ROK; and Taipei,China are obtained from Statista (accessed July 2020). The ultimate data sources are indicated below.
Sources: Analysys (2017); Cabauatan et al. (2018); CUTS International (2018a); Google and GfK (2018a); Google and GfK (2018b); Opensurvey (2019); and World Bank (2017).

Age Divide

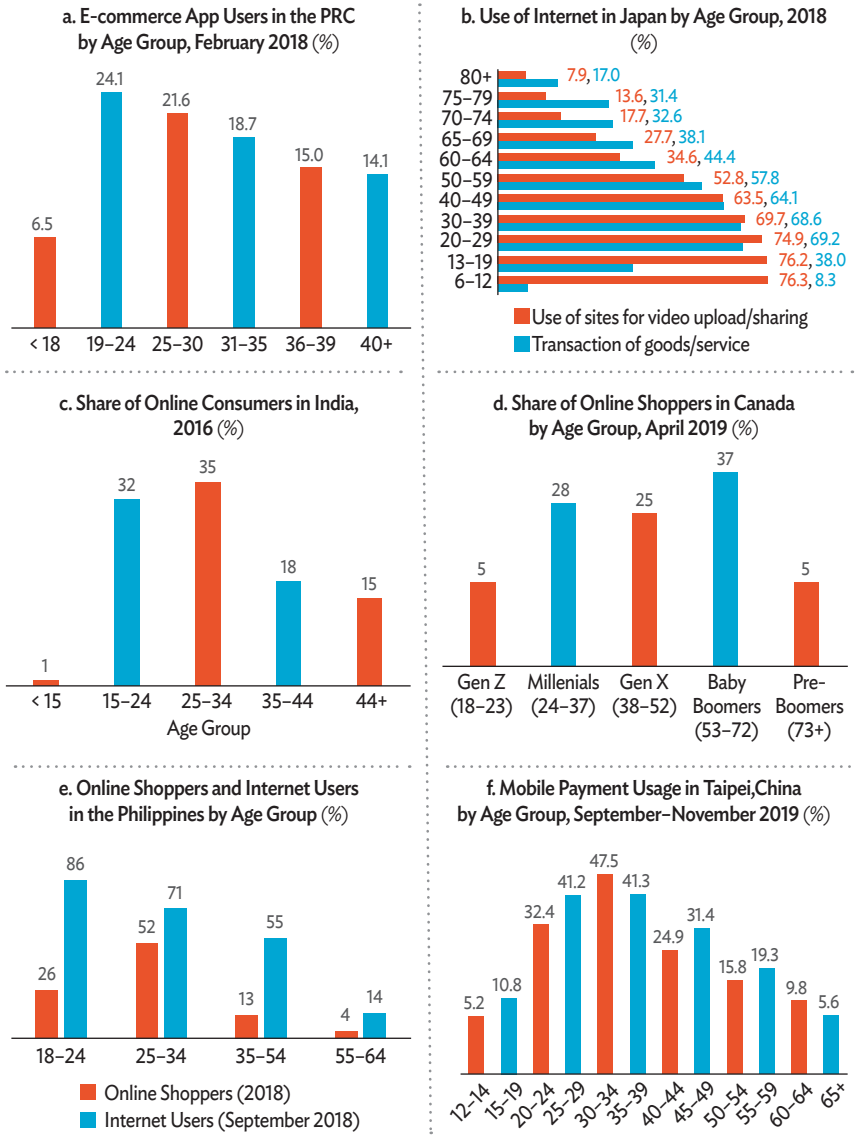
Internet access and participation in digital platforms are more common in the not so young or not so old (Figure 6.8). In the Philippines, while the 18–24 year olds are the most active internet users, the 25–34 year cohort does the most online shopping since this is the income-earning group. In Japan, the younger generations are more active in digital platform activities such as video sharing and uploading, but those that involve monetary transactions attract those already earning incomes.

In Singapore, 96.0% of those who were 15–34 years old in 2018 had individual access to a computer, while only 33.0% of those aged 60 years old and over did (Figure 6.9). In the Republic of Korea, the pattern for mobile internet usage is similar, although the peak is wider at 20–49 years old. The 60–69 cohort has high mobile internet use but significantly lower for the older ages.

The discrepancy in access by age groups is not only in material access but also in skills. In Sri Lanka, for example, computer or digital literacy is highest among 15–24 years old. These are similar to the patterns displayed in the Republic of Korea and Singapore. In the PRC, internet users are mostly 20–39 years old.

One reason the older age group ranks last in usage of technology and participation in the digital economy is that the generation did not grow up with the rapidly evolving digital technology unlike those who are younger (Viens 2019). Another possible reason would be the lack of a need to form personal and social identities over social media, as these would have been well established by the time social media platforms like Facebook launched. Motivational barriers, such as lack of interest and security issues, also explain the limited use of internet for the older generation, as they see no good reason to go online. The older generations are the least confident about protection for a range of security threats (Murnane 2016).

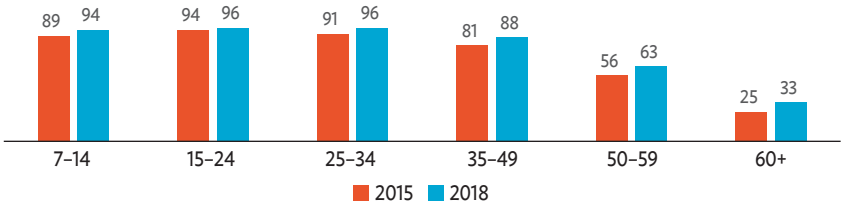
Figure 6.8: Participation in the Digital Economy in Selected Economies by Age Group



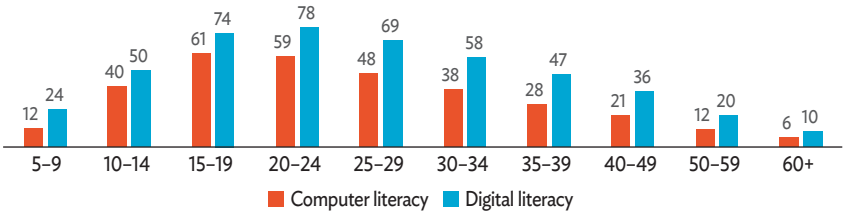
PRC = People's Republic of China.
Notes: The data for Canada; the PRC; the Philippines; and Taipei,China are obtained from Statista (accessed July 2020). The ultimate data sources are indicated below.
Sources: Canada Post (2020); Government of Japan, Ministry of Internal Affairs and Communications (2020); iResearch (2018); Picodi and Esquiremag.ph (2019); Quartz and Flipkart (2016); and Social Weather Stations (2018).

Figure 6.9: Access to the Internet in Selected Economies by Age Group

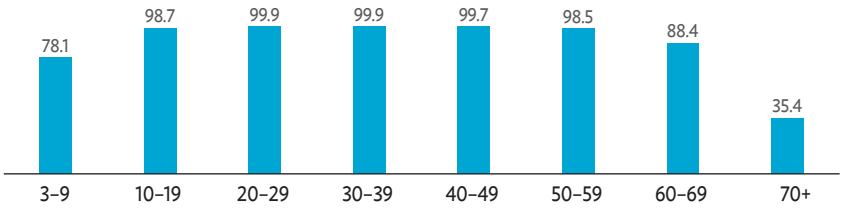
a. Percentage of Individual Computer Usage in Singapore by Age Group, 2015 and 2018 (%)



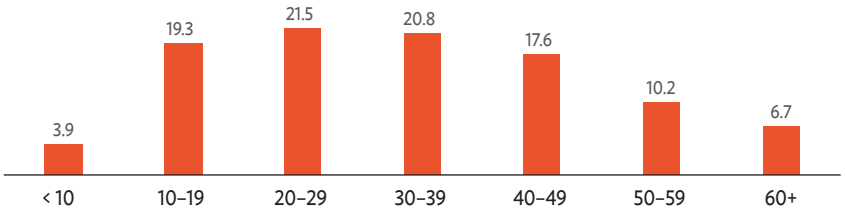
b. Computer and Digital Literacy Rates in Sri Lanka by Age Group, 2018 (%)



c. Mobile Internet Usage Rate in the ROK by Age Group, July–September 2018 (%)



d. Breakdown of Internet Users in the PRC by Age Group, March 2020 (%)

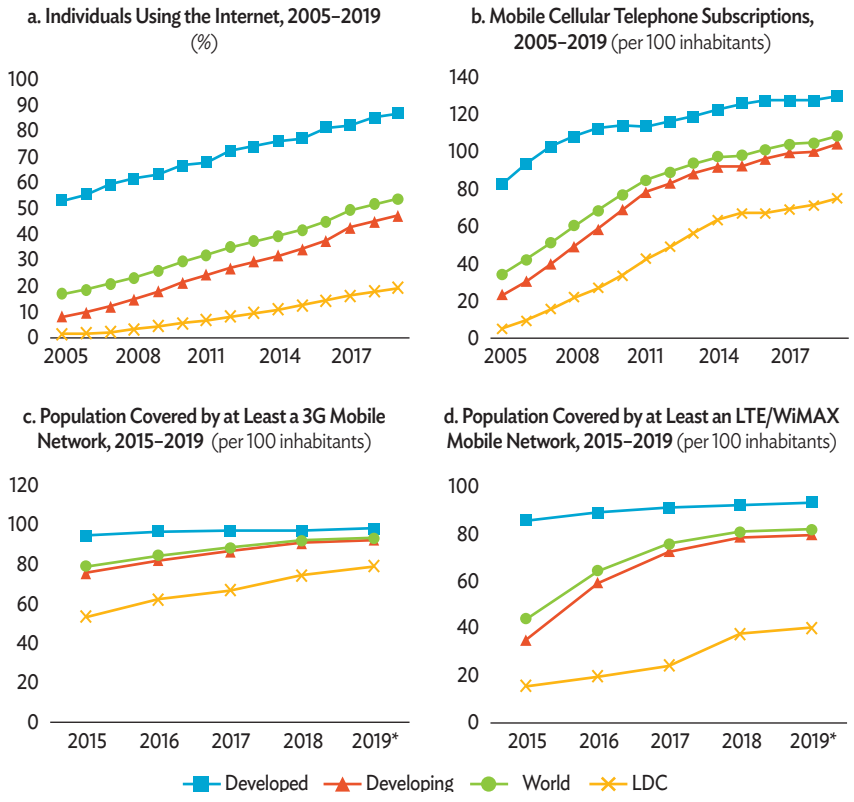


PRC = People's Republic of China, ROK = Republic of Korea.
Note: The data for the PRC and ROK are obtained from Statista (accessed July 2020). The ultimate sources are indicated below.
Sources: Government of the Republic of Korea, Ministry of Science and ICT, Korea Internet and Security Agency and Market Metrix (2019); Government of the People's Republic of China, China Internet Information Center. (2020b); Government of Sri Lanka, Department of Census and Statistics (2018), and Government of Singapore, Infocomm Media Development Authority (2019a).

Material Access

The material access divide is manifested in the gap in physical access to computers, network, and platforms among developed, developing, and least developed countries. The ratio of internet users to total population illustrates the differences in access among countries especially since the internet can be accessed via a number of devices (e.g., computer, mobile phone, personal digital assistant, video game consoles, or digital television). Figure 6.10a shows that more than 85.0% of the population in developed countries in 2019 used the internet, while it is 53.6% in developing countries and just 16.1% in least developed countries.

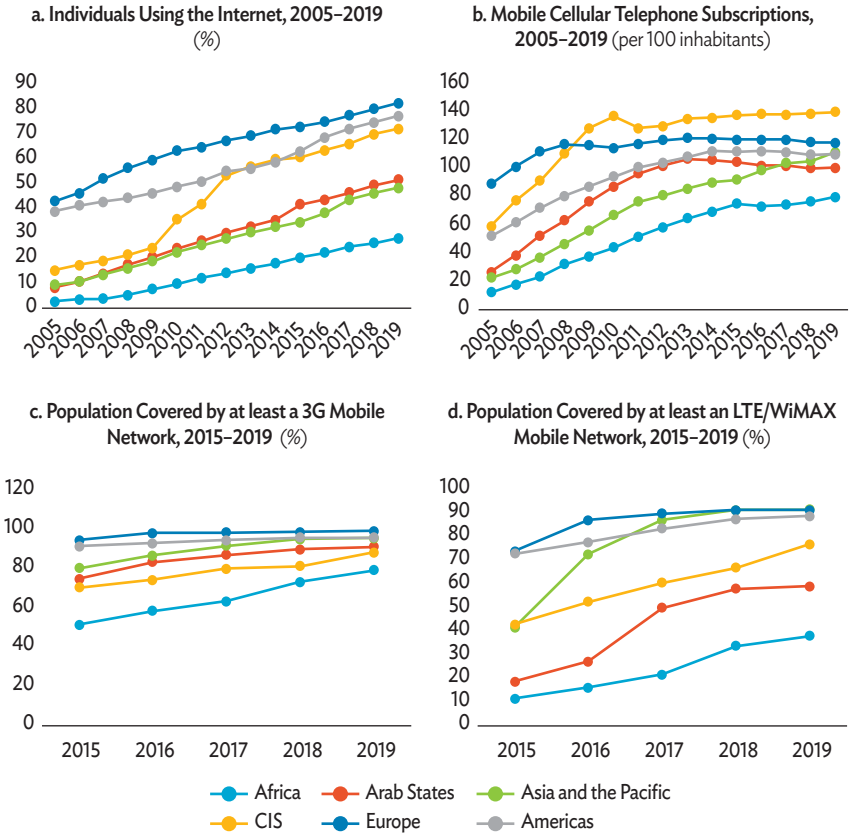
Figure 6.10: Selected Material Access Indicators by Income Groups



LDC = least developed countries, LTE = Long Term Evolution, WiMAX = Worldwide Interoperability for Microwave Access.
Note: 2019 data are estimates. The country groupings are based on the definitions of the source.
Source: Authors, based on International Telecommunication Union Indicators Database (accessed July 2020).

The Asia and Pacific region has the second-lowest proportion of people having used the internet in the past 3 months in 2019, while Europe, Americas, and the Commonwealth of Independent States (CIS) countries have the highest proportion in the same time period (Figure 6.11).[6]

Figure 6.11: Selected Material Access Indicators by Region



CIS = Commonwealth of Independent States, LTE = Long Term Evolution, WiMAX = Worldwide Interoperability for Microwave Access.
Note: 2019 data are estimates. The country groupings are based on the definitions of the source.
Source: Authors, based on International Telecommunication Union Indicators Database (accessed July 2020).

[6] The CIS was founded in 1991 after the dissolution of the Union of Soviet Socialist Republics. The CIS refers to Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, the Kyrgyz Republic, Moldova, the Russian Federation, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

The number of mobile cellular telephone subscriptions in the population is an indication of the potential access to the internet. Figure 6.10 shows that developed countries have significantly outpaced developing countries and least developed countries in mobile cellular telephone subscriptions. By region, the CIS has the highest mobile phone subscriptions since 2009, overtaking Europe (Figure 6.11). Asia and the Pacific subscriptions have risen steadily since 2005, closing the gap with Europe and the Americas. This is consistent with the trend in Asia's performance on the digital economy (Google, Temasek, and Bain 2019).

Mobile coverage of at least a 3G network indicates the availability of internet or mobile connection that can be used to participate in the digital technology, and Figure 6.10c shows that developed countries still outpace both developing countries and least developed countries in providing this service. The divide is more prominent for Long Term Evolution (LTE) and Worldwide Interoperability for Microwave Access (WiMAX) as shown in Figure 6.10d. The availability of a more advanced mobile network is necessary for new innovations in the digital economy (Docebo 2018; GSMA 2020), and with developing countries and least developed countries falling behind, this will surely lead to a gap in the usage of new applications. The Asia and Pacific region seems to be at par with the front-runner in this field as it has seen significant increases of this service from 2015, thus, overtaking the Americas (Figure 6.11d).

Data from GSMA's (2020) Consumer Insights Survey 2019[7] shows that while developing Asia has a high usage rate of smartphones for communication, it is lagging behind in terms of the use of smartphones for information, entertainment, and financial/digital commerce (Table 6.1).

North America, Western Europe, and Asia have the largest share of revenue in e-learning (Figure 6.12). Further, North American vendors are already exploring more advanced e-learning technologies such as artificial intelligence, virtual assistants, augmented reality, and virtual reality in e-learning solutions. So while other countries are still exploring currently available technologies in e-learning, such as the development of massive open online courses, more advanced regions are now pushing boundaries, expanding the divide.

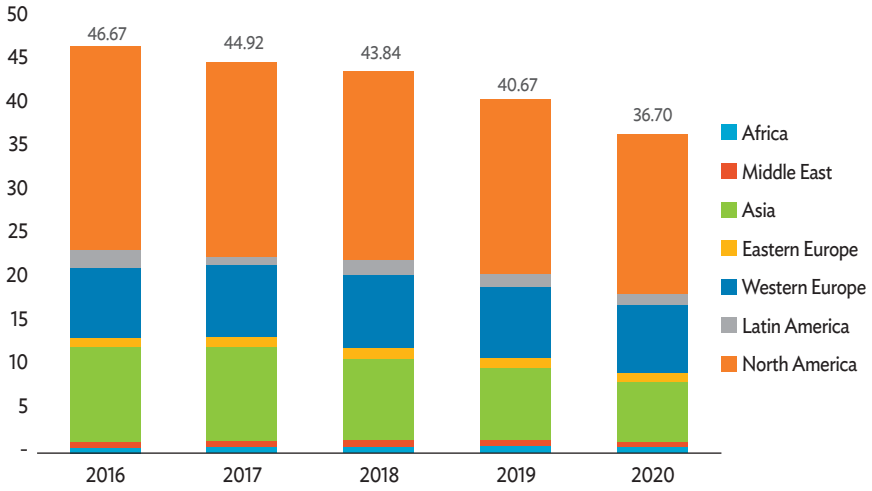
[7] This survey covers seven country groupings: developed Asia; developing Asia; Europe and the Commonwealth of Independent States; Latin America; Middle East and North Africa; North America; and sub-Saharan Africa.

Table 6.1: Smartphone Users Engaging in Activity At Least Once Per Week, 2019
(%)

Region	Communication	Information	Entertainment	Financial/Digital Commerce
Developed Asia	58	34	31	28
Developing Asia	68	18	25	12
Europe and CIS	63	36	30	26
Latin America	79	42	40	22
MENA	78	49	43	32
North America	60	35	38	28
Sub-Saharan Africa	67	19	22	17

CIS = Commonwealth of Independent States, MENA = Middle East and North America.
Note: The country groupings are based on the definitions of the source.
Source: GSM Association (2020).

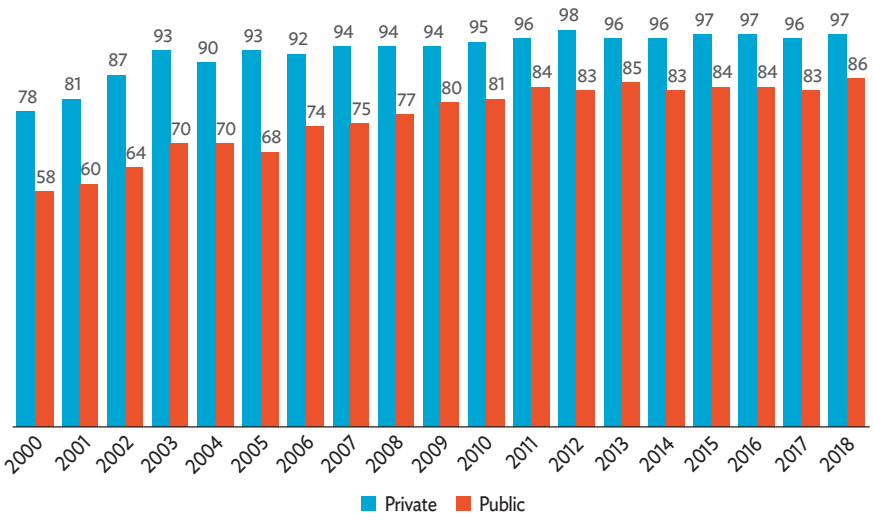
Figure 6.12: Worldwide Revenue Forecasts for Self-Paced Global E-learning Market Size by Region, 2016–2020, ($ billion)



Note: The country groupings are based on the definitions of the source.
Source: Docebo (2018).

According to UNCTAD's (2019) Digital Economy Report, the digital divide exists within countries based on income, education, gender, ethnicity, and geographical location, regardless of the country's level of development. Even developed countries see some material access divide among its population. For instance, computer ownership is 97.0% for those living in private housing and around 86.0% for those in public housing in Singapore (Figure 6.13).

Figure 6.13: Computer Ownership in Singapore by Housing Type, 2000–2018
(% of population)

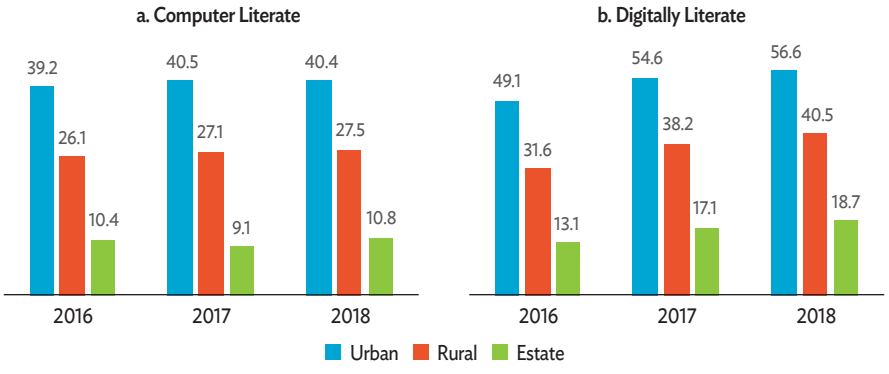


Source: Government of Singapore, Infocomm Media Development Authority (2019b).

In Sri Lanka, computer and digital literacies are significantly higher for those living in urban areas (Figure 6.14). In 2018, 40.4% of those living in urban areas are considered computer literate, only 27.5% in rural areas, and just 10.8% among those living in estate areas. [8]

[8] In Sri Lanka, estate areas refer to "all plantations which are 20 acres or more in extent and with 10 or more resident laborers." These areas are characterized by low living standards and widespread poverty. Also, the estate sector has traditionally been behind both the urban and rural sectors. For a background on Sri Lanka's poverty and welfare, see Newhouse, Suarez-Becerra, and Doan (2016).

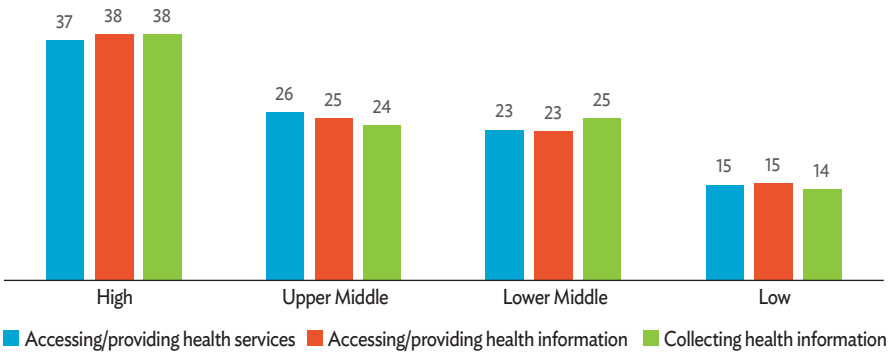
Figure 6.14: Computer and Digital Literacy in Sri Lanka by Area, 2016–2018
(% of population)



Source: Government of Sri Lanka, Department of Census and Statistics (2018).

High-income countries have more mobile health programs than low-income countries (Figure 6.15). For instance, from among all countries that accessed or provided health services, high-income countries had a 37.0% share, more than double that of low-income countries.

Figure 6.15: Distribution of Mobile Health Programs by Income Group
(% share of total)



Note: Accessing/providing health services include health call centers, toll-free emergency calls; treatment adherence; appointment reminders; mobile telehealth; and emergencies, while accessing/providing health information includes community mobilization; access to information, resources, databases, and tools; decision support systems; electronic patient information/records; and mLearning. Meanwhile, collecting health information refers to health surveys, surveillance, and patient monitoring. The country groupings are based on the World Health Organization (WHO) definitions (2016).
Source: Authors, based on WHO (2016).

Skills Access

Countries with higher income tend to have more people with digital skills (Table 6.2). As these countries gain more from the digital and platform economy, the low-income and lower middle-income countries will fall further behind in digital access and development.

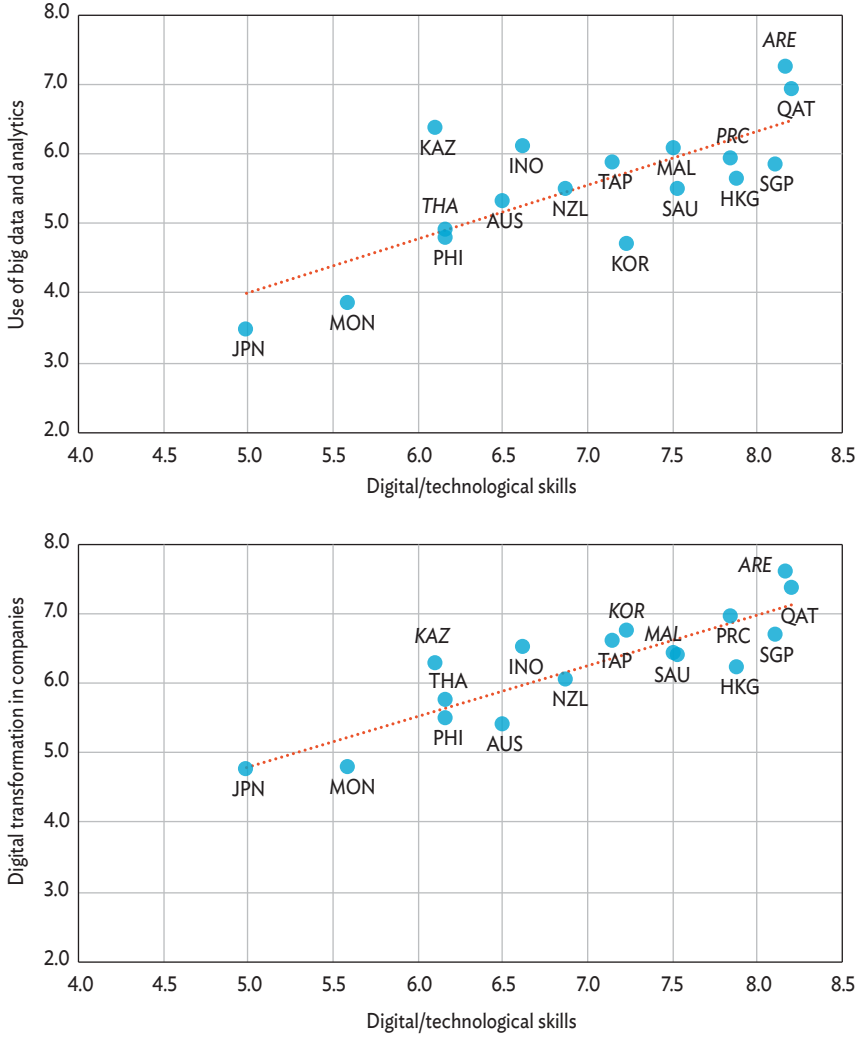
Table 6.2: Digital Skills by Region and Income Group, 2017 and 2019
(score)

Region and Income Group	2017	2019
East Asia and the Pacific	4.7	4.6
High income	5.1	5.0
Upper middle income	4.8	4.8
Lower middle income	4.1	4.1
Europe and Central Asia	4.7	4.6
High income	4.9	4.9
Upper middle income	4.3	4.3
Lower middle income	4.4	4.3
Low income	no data	4.4
South Asia	3.8	4.0
Upper middle income	3.9	4.2
Lower middle income	3.9	4.0
Low income	3.7	3.7

Note: Extent to which population possesses sufficient digital skills (e.g., computer skills, basic coding, and digital reading). 1 = not all; 7 = to a great extent. Data are based on the World Economic Forum's Global Competitiveness Index 4.0: Digital Skills Among Population indicator. A change in methodology occurred in 2018, so 2017 data have been backcast. The technical note on "backcasting" in the 2017 edition of the GCI 4.0 describes the use of "*the GCI 4.0 methodology, the weighted averages of the 2016 and 2017 editions of the Executive Opinion Survey (in most cases) and the values for all the other indicators from one period earlier than the period used in the 2018 edition of the GCI 4.0*" (e.g., for the latter, if an indicator for 2018 GCI 4.0 uses 2016 data, the backcast 2017 edition uses 2015 data). Further description can be found here: https://reports.weforum.org/global-competitiveness-report-2018/appendix-c-the-global-competitiveness-index-4–0-methodology-and-technical-notes/. The country groupings are based on the definitions of the data source.
Sources: Authors, based on World Bank TCdata360 (accessed May 2020) and Schwab (2017, 2019).

Figure 6.16 shows a positive correlation between having digital technological skill and use of advanced data analytics and data analysis. There is also a positive correlation between digital and technological skills availability and digital readiness of companies. Without digital and technological skills, people would tend to use ICT for less productive purposes.

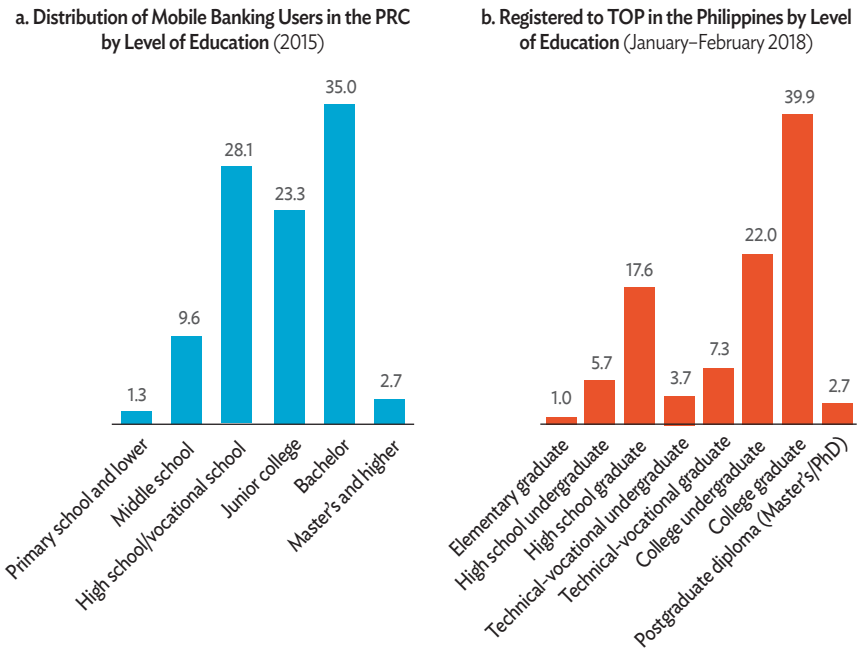
Figure 6.16: Digital and Technological Skill and Use of Advanced Technologies in Selected Asian Economies, 2019



AUS = Australia; ARE = United Arab Emirates; HKG = Hong Kong, China; INO = Indonesia; JPN = Japan; KAZ = Kazakhstan; KOR = Republic of Korea; MAL = Malaysia; MON= Mongolia; NZL = New Zealand; PHI = Philippines; PRC = People's Republic of China; QAT = Qatar; SAU = Saudi Arabia; SIN = Singapore; TAP = Taipei,China; THA = Thailand.
Notes: Use of big data analytics is based on the assessment of the respondents to the Executive Opinion Survey on whether companies are very good at using big data and analytics to support decision-making. They score from 1 (lowest) to 10 (highest). Digital transformation in companies is based on whether digital transformation in companies is generally well implemented. Respondents score 1 (lowest) to 10 (highest). Economy labels are placed below their data point but some economy labels (italicized) are placed above their data point to improve chart readability.
Source: Authors, based on IMD World Competitiveness Online (accessed July 2020)

Figure 6.17 shows that the better-skilled have better digital access. Usually, in the Philippines, college undergraduates and college graduates would register to the Technical Education and Skills Development Authority (TESDA) Online Program.[9] It is also those who have higher education who use mobile banking in the PRC.

Figure 6.17: Selected Cases and Educational Attainment
(%)



PRC = People's Republic of China, TOP = TESDA Online Program.
Note: The data for the PRC are obtained from Statista (accessed July 2020). The ultimate source is indicated below.
Sources: Analysis (2016) and Cabauatan et al. (2018).

Analysis of unpublished data from the Philippines' 2019 National ICT Household Survey results shows that people who have access to computers make use of the technology mostly for basic communication and for entertainment

[9] In the Philippines, TESDA is a government agency that provides technical and vocational education and training. One of their programs to expand reach is the TESDA Online Program. For more on the TESDA Online Program, see: https://www.e-tesda.gov.ph/.

and gaming. A smaller number use it to send e-mails, encode data, use word processing software, and transfer files between a computer and other devices, and even for distance/online/computer-aided learning. The more advanced tasks—such as running a software program, data management and analysis, using modeling, simulation, and rendering software—are performed by the least number of computer users. Those with higher education tend to use the internet for more advanced tasks, such as using the internet for learning (e.g., online courses, academic research, e-books, and dictionaries); production of creative or user-generated content (e.g., managing a personal homepage, blogging, and vlogging); and online transactions (e.g., online banking, online booking/reservation, and online shopping).

Digital platforms also face (or cause) their own usage divide.

As platforms continue to be embraced, new manifestations of divides stemming from the use of the platform may be observed. As early as 2011, van Deursen, van Dijk, and Peters (2011) foresaw the appearance of a usage gap between those who systematically use and benefit from advanced digital technology and the more difficult applications for work and school, and those using basic digital technologies for simple tasks and mostly for entertainment.

Platforms may disproportionately benefit those who are already better off.

Accommodation platforms

Airbnb is one of the successful start-ups that benefited from the sharing economy. Airbnb defines itself as "a social website that connects people who have space to spare with those who are looking for a place to stay" (Quattrone et al. 2016). Since the company's establishment in 2008, it has grown to more than 1.5 million properties and a global presence in over 190 countries.

Using data from Inside Airbnb,[10] Tom Slee,[11] and unofficial maps available online at the Database of Global Administrative Areas (GADM),[12] Quimba, Rosellon, and Calizo (2020) observed Airbnb postings in four areas: Hong Kong, China; Seoul, Republic of Korea; Singapore; and Sri Lanka.

[10] Inside Airbnb is a website maintaining open data of public Airbnb listings across 25 countries. For more on Inside Airbnb, see http://insideairbnb.com/.

[11] Tom Slee has collected Airbnb listings from cities around the world. He provides open access data through his blog: https://tomslee.net/category/airbnb-data.

[12] GADM is a project hosted by the Center for Spatial Sciences at the University of California, Davis that provides shape files of administrative areas in all countries at all levels of subdivision.

The maps show that there is a concentration of Airbnb postings in the central districts and busy areas. Areas in the periphery, while having some Airbnb postings, do not enjoy the scale that is observed in the central districts.

Airbnb listings proliferating in areas with high levels of commercialization and near areas of interest were also observed in European countries, such as Bulgaria (Roelofsen 2018), Switzerland (Larpin et al. 2019), and Spain (Adamiak et al. 2019). Furthermore, studies have shown that the patterns of participation in Airbnb (proxied by the distribution of Airbnb listings) are closely related to the distribution of tourism demand and accommodation capacity (Adamiak et al. 2019; Domenech et al. 2019; Strommen-Bakhtiar and Vinogradov 2019). The use of the platform may exacerbate the highly unequal distribution of income and development between rural and urban areas.

Case of crowdwork/gig economy[13]

Crowdworkers are well educated, as shown by data in 2017. Close to one-fourth of the workers have a technical certificate or have some university education, 37.0% have a bachelor's degree, while 20.0% have a postgraduate degree or higher education. Those who have only a high school diploma make up barely 18.0% of crowdworkers (Figure 6.18).

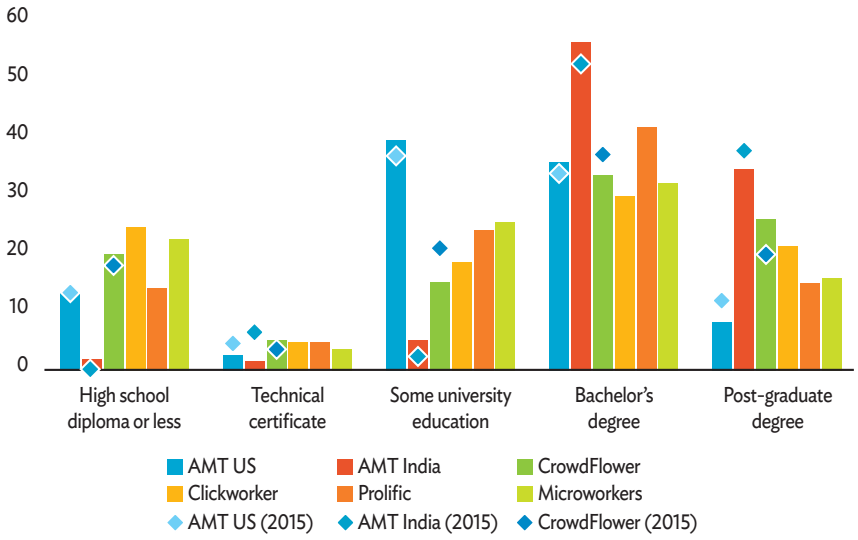
In addition, "Upwork" jobs remain limited by freelancers' skills and capabilities. For instance, data from Upwork shows that most of the jobs available to freelancers require advanced knowledge in computer programming. A quick scan of the top 30 trending jobs posted in the past 12 hours[14] requires technical skills that can be divided into three major groups: (i) creative (photo editing, creative writing, copywriting, animation, landscaping, graphic design); (ii) technical (technical writing, HTML or website development, programming (Python), data extraction, and language translation); and (iii) administrative support, which had only two job posts (6.7%).

Earning from platforms is affected by ownership of capital.

[13] The gig economy is being referred to jobs or "gigs" that are short term or intermittent and temporary, wherein work can be transacted online using digital platforms (web-based or location-based applications) and delivered online or offline (bound to a specific location). Crowdwork refers to work where "*tasks are assigned to a specific individual or given to an undefined group of people online (crowd)*" and are transacted and delivered online (Bayudan-Dacuycuy et al. 2020, 4). Examples of crowdsourcing platforms are Amazon Mechanical Turk (AMT), Clickworker, CrowdFlower, Microworkers, Prolific, Upwork.

[14] Top 30 trending jobs in Upwork as of 19 May 2020, 1:48 PM (Philippine Standard Time). Upwork's freelance jobs by category can be accessed here: https://www.upwork.com/freelance-jobs/.

Figure 6.18: Educational Level of Crowdworkers by Platform
(%)



Note: The International Labour Organization conducted two surveys of "crowdworkers": one in 2015 (diamonds) and another in 2017 (bars). The 2015 survey's sample consisted of workers who had completed at least 500 tasks, and had achieved a 95.0% or greater task acceptance rate from the platform Amazon Mechanical Turk (AMT). Apart from AMT, the 2015 survey also included quality workers from CrowdFlower. In 2017, the survey's sample was expanded to include other quality workers from other crowdsourcing platforms, such as Clickworker, Microworkers, and Prolific.
Source: Berg et al. (2018).

The study by Farrel and Greig (2016) shows that those who have assets which can be leased earn more from digital platforms (Figure 6.19) than those who participate only in labor platforms.

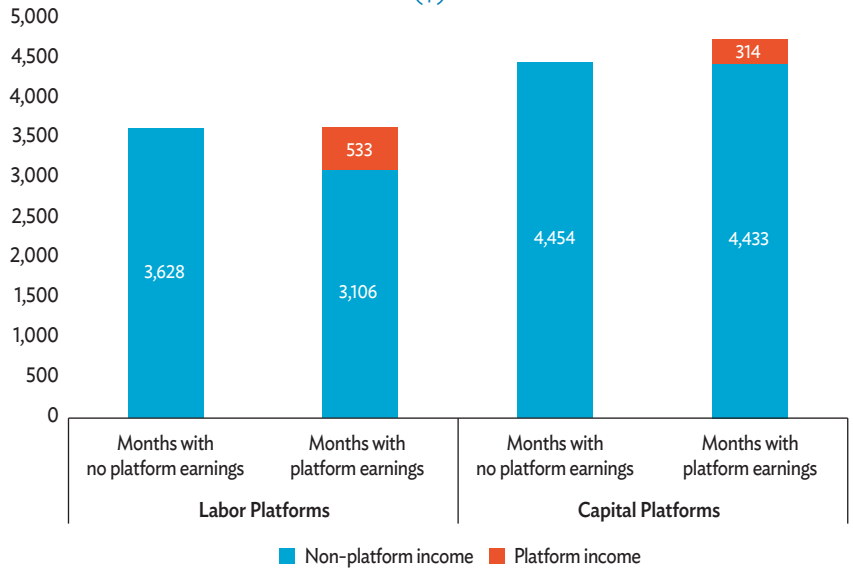
There are indirect users of digital platforms.

Certain segments of the population make use of platforms through proxies. Llanto, Rosellon, and Ortiz (2018) analyze the case of Konek2Kard[15] in the Philippines and find that clients experienced an easier, faster, and more convenient service, which includes the ability to transact in real time throughout the day—an important feature considering that these clients are either working or busy with household chores—with the use of digital platforms. Proxy users, such as older clients who let their grandchildren or

[15] "Konek2Kard" or "k2c" is a mobile banking application introduced by CARD Bank, a microfinance-oriented rural bank in the Philippines (Llanto, Rosellon, and Ortiz 2018).

Figure 6.19: Earnings in Months with and without Platform Earnings in the United States

($)



Source: Farrel and Greig (2016).

younger kin perform their online activities, were also observed implying a skills gap between using a mobile phone and doing transactions on digital platforms.

Trusting and comfortably using ICT does not translate to trusting digital platforms.

Many studies have raised a number of challenges to achieving effective e-learning, which are strongly related to digital divide.[16] The most obvious barrier is lack of material access. These same studies have raised the importance of having access to stable and reliable internet in order for e-learning to be successful. But as demonstrated by van Dijk's (2006) model, the platform technology will face its own set of barriers to access. For instance, the motivation and perception of teachers and students of the benefits of digital platforms in learning have to be considered. In Viet Nam, teachers and students doubt the effectiveness of internet learning, remarking that

16 See Kovachev et al. 2011; Rogers 2011; Handal, MacNish, and Petocz 2013; Sarrab, Al-Shihi, and Rehman 2013; Kim, Lee, and Kim 2014; Rius, Masip, and Clariso 2014; Cabauatan et al. 2018; CUTS International 2018a.

e-learning is inferior to face-to-face learning (MacCallum and Jeffrey 2009; CUTS International 2018a). Others cite privacy concerns (Cummings, Merrill, and Borrelli 2010; Binsaleh and Binsaleh 2013; Popescu and Ghita 2013) and distractions (Handal, MacNish, and Petocz 2013; Morales 2013) as factors affecting motivation to use e-learning platforms. Segments of the population that face this motivational divide would not even consider using e-learning.

6.3. Conclusions and Policy Recommendations

This chapter presents the manifestations of digital divides in Asia in terms of ICT indicators and factors related to access, such as culture, trust, and skills. These are demonstrated as differences in access of certain groups, by geographic location, age, gender, and adequate skills. The more educated and wealthier are seen to benefit more from the digital economy as they are able to participate more in online shopping, produce more content online, and use e-learning and e-health platforms.

As noted by van Dijk's (2006) model, the digital platforms also create their own divides. The case of accommodation platforms shows that the more commercialized, well-off, and touristy areas will benefit more from digital accommodation platforms thus further intensifying the income and development inequality between these areas and the periphery. Some platforms also face trust and security issues while other platforms will tend to increase the income inequality among individuals as documented by the study of JP Morgan (Farrell and Greig 2016) on ownership of assets for use in platforms.

Given the findings of this chapter, the following are recommendations for policy reforms as also laid out in ADB (2021) and Quimba, Rosellon, and Calizo (2020):

i. Define and measure various indicators in the four areas of access and participation in digital platforms. There were scarce data from Oceania and other island countries in the Pacific. It is crucial to have complete data on standard indicators to fully understand the complete picture of digital divides in Asia.

ii. Address various barriers simultaneously to maximize and distribute the gains from digital platforms. Ensuring material access and the

requisite infrastructure to support internet access are necessary conditions for participation in digital platforms, but these are not sufficient. There is also a need to address cultural barriers and skills inadequacy.

iii. Support projects that would provide at least material access to ICT in least developed countries. Data show that least developed countries fall behind other economies in ICT access and participation in the platform economy. With ICT infrastructure remaining inadequate, it would be difficult for least developed countries to catch up with the developed economies. Governments need to recognize the impact of disparities in digital access and participation in the platform economy on income inequality.

iv. Work with governments to develop plans for utilizing digitization, to facilitate innovation, and to support start-ups in developing platforms which are based on mobile applications. Use of mobile phone and digital technology must be pushed beyond communication and entertainment and into higher-value products and services like e-learning, e-health, creatives, and artificial intelligence protocols.

v. Cooperation among countries must be facilitated to ensure, over time, the convergence of ICT access and participation in the platform economy, likewise to safeguard data privacy and maintain trust in the digital economy.

vi. Support greater digital skills development for the youth. The data from Upwork reveals that most of the tasks involved are computer-related and require familiarity with the internet. There is a need to reskill and retool adults to allow and expand their participation in the digital economy. There is also a need to educate people on the functions of and benefits from using digital technology.

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