COVID-19 and Internet Accessibility in the MENA Region

Maximizing digital skills and connectivity for economic recovery

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Introduction

The Covid-19 pandemic has had a profound impact on the economies of the Middle East and North Africa (MENA), leading to a rise in unemployment, a contraction of economic growth, supply chain delays, and increasing inflation.

Due to a decline in demand for oil and sudden halt to economic life, real Gross Domestic Product (GDP) in the MENA region shrank by 3.2 percent in 2020. According to the International Monetary Fund, it is projected to grow again by 4.1 percent in 2021 and 2022. Unemployment stood at 11.6 percent and the lender highlighted that "the low-skilled, the young, women, and migrant workers were affected the most" by the pandemic. Youth unemployment already stood at over 25 percent in 2019, and employment for youth declined an additional 10 percent in 2020.[1]

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The forced shift to remote work and education has increased pressure on regional governments to ensure their populations have regular and consistent internet access at an affordable rate. Some governments worked out emergency measures with Internet Service Providers (ISPs) and telecommunications companies to broaden access, for example by zero-rating certain websites or increasing the size of Internet data bundles for consumers. Despite some improvements, however, the lockdowns have highlighted how unequal access to the internet in the region negatively impacts education outcomes and economic opportunities for underprivileged groups such as women and rural populations.

For example, in terms of education, a World Bank report on Lebanon stressed that around 60 percent of students "either do not have a computer or have to share it with at least 3 other family members." Another recent estimate said only around 50 percent of students in Lebanon were connected to online learning.[2] Therefore, unequal access will a have real-world impact on learning and make recovery more challenging for certain segments of society.

This comes at a time when government and donor efforts to increase internet coverage is increasingly recognized as insufficient to providing access. For example, despite 95 percent of people in Arab States living in range of at least a 3G mobile Internet signal, internet use in the region was only 66 percent in 2021: an increase of 11 percent from 2019.[3] Beyond coverage, internet accessibility involves the price of mobile or fixed broadband relative to income, availability of end devices to access online content, the relevance of content, and the level of digital literacy within the population.

> ## Unequal access will a have real-world impact on learning and make recovery more challenging for certain segments of society.

This paper will argue that increasing internet accessibility and improving digital skills development can build on the steps that various governments have taken during the pandemic to form a digitally-enabled economic recovery strategy. However, policy planning and implementation needs to focus more on making the digital transformation in the MENA region inclusive and to bridge digital divides, which are becoming the new face of inequality around the world.

Connectivity

Internet access in the MENA region varies significantly between countries and subregions, with certain Gulf Cooperation Council (GCC) countries displaying some of the highest Internet user rates in the world. In total, around 66 percent of individuals overall and 73 percent of youth in Arab states were estimated to have used the Internet in 2020. The region scores similarly to the global average regarding the number of individuals in urban areas using the Internet at home at 76 percent, according to the International Telecommunications Union.[4]

Whereas Internet usage has generally increased, the digital gender gap in Arab states is the largest in comparison with other world regions, with women being 12 percent less likely than men to use the Internet. The regional digital gender gap

Group of children in reading education class location Shalatin, Egypt. tools12/shutterstock.com

increased problematically between 2013 and 2019, slightly shrinking recently. According to the Global System for Mobile Communications Association, a telecommunications industry body, the gender gap in mobile ownership between 2017 and 2020 increased from 8 to 9 percent, while the gender gap in mobile Internet use fluctuated during the same time period (but decreased slightly to 17 percent). In total numbers, 63 million women in the MENA region are not using mobile Internet, the main gateway to online content among most people.[5]

According to a survey for the Mobile Gender Report 2021,[6] he top barriers for women using the Internet were affordability, safety and security and a lack of literacy and digital skills. "Women and girls started using the internet more frequently during the global pandemic despite the fact that the Arab region suffers from an alarming digital gender divide. This increase was tightly coupled with an increase in cyber violence, particularly for users with limited digital skills, particularly women and girls," according to Sukaina al-Nasrawi, Social Affairs Officer and lead of the portfolio on Smart, Safe and Resilient Cities

in the Arab region at the United Nations Economic and Social Commission for Western Asia (ESCWA). The report's authors highlighted that "discriminative social norms also remain a challenge,"[7] which impacts the ability to access the devices necessary to use the Internet, as the use of computers is gendered in the Arab region, with priority access often given to male family members.[8]

The digital gender gap is a global phenomenon with negative economic consequences for the MENA region. In a recent report, the World Wide Web Foundation estimated that "[c]ountries have missed out on $1 trillion USD in GDP as a result of women's exclusion in the digital world." For 2020 it estimated that the exclusion of women in the digital economy amounted to a GDP loss of $126 billion globally.[9] The authors' Costs of Exclusion model, based on 32 countries, included five MENA countries: Algeria, Egypt, Morocco, Sudan, and Tunisia. Closing the digital gender divide is core to reducing vulnerabilities of communities and increasing their resilience. It is also central to achieving gender equality and sustainable development.[10]

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A large urban-rural divide also remains a significant problem in the region, with only 42 percent of rural households in Arab states using the Internet and only 34 percent of individuals in rural areas having access to a computer.

What does being connected mean?

The MENA region is projected to have 160 million potential digital users by 2025.[11] However, as highlighted above, access to the Internet remains highly unequal. A key issue in this regard is the affordability of Internet bundles. Prices of fixed broadband baskets is above the affordability target of 2 percent of monthly Gross National Income (GNI) per capita set by the UN Broadband Commission.[12] Out of the seven MENA countries[13] included in the Alliance for Affordable Internet's 2020 Affordability Report,[14] only Morocco is listed in the top 10, with Jordan coming in 21st place as the second-highest ranked Arab country.

As the majority of people in the region access the Internet on a mobile device, mobile Internet speeds are crucial to enable people to gain skills and work online. In Arab states, however, only 70 percent of the population according to ITU estimates is covered by a 4G network, the second-lowest percentage out of all world regions after Africa. ITU data measured

that 34 percent of the population in Arab states was not using the Internet in 2021. Meanwhile, the GSMA (2019) calculated a mobile Internet usage gap of 47 percent in the entire MENA region, meaning that almost half of the people living in an area covered by a mobile broadband network are not using the Internet. Egypt and Lebanon are two countries where such a gap exists.[15] Furthermore, only nine out of 100 inhabitants in Arab states used fixed broadband subscriptions, the second-lowest rate of all world regions, after Africa.

The high proportion of Internet users in the region using a mobile device has important consequences for both digital skills training (discussed below) and the ability to conduct remote work. As evidenced by the case of Lebanon, efforts to increase accessibility of the Internet cannot just focus on coverage and affordability, but also the availability of end devices. In the realm of education, it also entails designing content for the type of devices students will use (most distance learning courses are designed for PCs rather than mobile phones), including providing zero-rated websites and offline content to reach those less able to afford a computer with fast Internet. In this context, the conversation is moving increasingly towards Internet accessibility rather than simply coverage.

Did access improve?

As the Internet became an absolute necessity during the pandemic for most people, governments, ISPs and mobile operators (state-owned and private) took a range of measures to improve access. Between March 2020 and March 2021, most measures were

implemented in the areas of affordability and e-learning, according to the World Bank.[16] The following table highlights some of these measures:

Figure 1: Examples of interventions in the ICT sector during the Covid-19 pandemic

Country	Type of intervention
Bahrain	Mobile and Internet service provider Batelco[17] supported e-learning by providing free browsing on several education websites.
Egypt	Vodafone offered 20 percent extra data for free on all DSL and home bundles, while the government said it would cover the cost of providing a 20 percent increase in all subscribers' monthly download quotas.
Iraq	Asiacell offered a free Internet package to access educational content for primary and secondary students.
Jordan	Zain partnered[18] with the United Nations Children's Fund to offer the Learning Passport, a virtual scheme allowing people to continue their studies and skills development from home.
Morocco	Telecommunications company Inwi granted students in Morocco free access to training sites by the Ministry of National Education.

Sources: Batelco, GSMA, World Bank

The interventions presented above were much needed. However, over a year and a half after the Covid-19 pandemic exposed the accessibility crisis, national efforts to move from stopgap measures to sustainable policies remain missing. "We have not yet seen a sustainable kind of policy that could maintain the accessibility and the connectivity that we have seen at the beginning of the pandemic," said Nermine El Saadany, Regional Vice President for the Middle East at the Internet Society.[19] For example, the decisions taken by several MENA governments to unblock the use of certain Voice over Internet Protocol (VoIP) services (such as WhatsApp, Skype, and Zoom) have not become official policy and could easily be reversed.

Digital Infrastructure

MENA countries generally "leapfrogged" traditional copper telephone network development straight to the use of mobile phones, explaining why most people today connect to the internet through mobile broadband. However, the spread of fixed broadband and fiber optic connections is still very limited, which limits the ability to host internet content locally and inhibits the growth of the digital economy. Internet usage gaps, especially among the rural-urban divide, prevents rural populations from gaining the necessary digital skills to participate in the digital economy. The development of digital infrastructure overall continues to lag behind the rest of the world, holding back the MENA region's digital transformation.

Because mobile data is the preferred method of accessing the internet, 67 percent of people in the Arab countries of the region used the internet through a mobile device while only nine percent accessed it through a fixed broadband connection in 2021.[20] However, according to GSMA data, around 60 million people were still not covered by a mobile network in 2019. This is due in part to the limits of preexisting telecommunication infrastructure. With the exception of Lebanon, Israel and Palestine, and Tunisia, all MENA countries have significant mobile Internet coverage gaps, a particular problem in geographically large countries like Algeria, Libya and to a lesser extent Egypt.[21]

In terms of fixed internet connections, areas where incumbent telecommunications firms (usually owned by the national government) had already built out copper phone cable networks were able to convert part of their service to DSL internet connections. Consequently, although a minority of households in the region access the internet through fixed connections, the dominant method in many countries remains DSL.[22] Most countries have very insignificant development in fixed fiberoptic connections, with the exception of the UAE and Qatar, which cover about 80 percent of households directly with fiber.[23]

Though mobile is still an effective means of accessing the internet, fiber connections offer much greater speeds, bandwidth and reliability compared with mobile data or DSL. In addition, fixed fiber connections are increasingly necessary for businesses and other institutions, such as schools and hospitals, that must transmit large amounts of data or connect with hundreds of local users simultaneously. Fiber is also the means by which countries and subnational networks can connect to undersea cables that bring them digitally to the outside world.

Digital Content

Unfortunately, the lack of available fiber limits the establishment of data centers and Internet exchange points (IXP) which rely on cables to connect to providers and the national backbone network.[24] Data centers are places where content is stored while IXPs are internet intersections, where different networks (local ISPs, governments or research

networks) connect to exchange local traffic. Without local IXPs, providers must connect to one overseas in order to communicate with other networks, increasing latency and lowering peak usage efficiency. Similarly, if most internet data is cached abroad, it must travel farther for people to access. As it stands, the lack of local IXPs means that around 80 percent of Middle East internet traffic is routed through Europe.[25]

Figure 2: Data centers in different world regions

Region	Number of colocation data centers
Middle East and North Africa	77[26]
Latin America and Caribbean	167
Europe	1,725
North America	2,006
Asia	490

Source: Data Center Map *(2021)* [27]

Several countries in the region, such as Algeria, Iraq, and Tunisia, do not have their own IXPs, and 12 countries in the MENA region have at least one.[28] Oman recently added one in May 2021. Beyond making the Internet faster, IXPs also help countries cut the cost of international IP transit services. This service is sold by an international backbone provider that delivers international internet traffic to and from national ISPs. Consequently, because data MENA users must access travel long distances, ISPs push this cost onto consumers, further reducing the affordability of fast internet. According to an Internet Society estimate, the establishment of IXPs in Egypt, Saudi Arabia and Kuwait led to yearly savings for each country of between $3.9-$5.7 million.[29]

A look at the impact of the expansion of existing IXPs in Kenya and Nigeria between 2012 and 2020, as studied by the Internet Society, provides a helpful overview of the benefits of hosting content locally and entails lessons for MENA countries. Both countries' investments in expanding its local digital infrastructure brought enormous benefits within eight years:

- Internet users more than doubled in both countries

- In Kenya, mobile broadband subscribers increased 100-fold to almost 42 percent of the population, while the price of data decreased by 50 percent

- In Nigeria, the price of 500mb prepaid data decreased from $12.75 in 2012 to $3.27 in 2020

- Localized traffic in both countries reached approximately 70 percent in 2020, up from 30 percent eight years earlier.[30]

Governments can encourage ISPs to connect to an IXP by connecting their own e-government services, meaning that service providers need to connect to the exchange point to enable their customers to reach government services.[31] The ecosystem of the

IXP is a "very, very important component", according to El Saadany, who stressed the government's essential role in creating the right environment. She added that the incumbent telecom operator should not think of an IXP as a competition, but rather "understand that this is an essential component of the Internet infrastructure ecosystem that would help them move forward with their plans."

Improving local infrastructure is also closely tied to increasing local content and hosting it in the country. The lack of relevant content in Arabic is a barrier for many people who may want to use the internet, further contributing to the digital divide.[32] The region faces a dilemma in this regard, as ISPs are waiting for more content to be provided, while content creators are waiting for service providers to provide the necessary infrastructure. Many websites generating local content are hosted abroad because there is no local data center.[33] As highlighted by the examples of Kenya and Nigeria, hosting content locally brings economic benefits and increases usage by improving latency. This increases data revenues for ISPs. Efforts particularly in MENA countries to improve the local digital infrastructure could help increase internet adoption through lower prices and the availability of more relevant content.

Last mile connections

The last step in internet infrastructure is the connection to the home and the individual. As mentioned, most people in MENA connect to the internet through a mobile provider, and mobile coverage is widespread. However, usage gaps indicate that the range of these networks is not enough to provide internet to the whole population. Furthermore, limited fixed broadband connections mean that most people are connecting with

relatively high latency and low bandwidth, which limits the ways in which they can use the internet, including by working from home or participating in distance learning.

Connecting more households directly to fiber would provide vast improvements, and also make it cheaper to establish more data centers and IXPs. However, building out these networks where there are currently none will be costly, and the rollout of fiber is likely to be concentrated in urban centers for the time being. For those who live within range of broadband service, lowering the cost to purchase internet bundles, including through demand-side subsidies or budget-pricing plans, along with cheap end devices and digital skills training, can give more people access to reliable internet.

Meanwhile, many - especially rural - areas are not yet commercially viable for large ISPs to establish a consumer base. One option to provide last mile service to these areas is to establish community networks. "The community has to have a role that is not yet seen in the region," said El Saadany. According to the Internet Society, which helps to set up community networks, they "are a complementary access solution built by the community and for the community with the support of the government and the private sector." In order to connect marginalized groups, it is vital to engage local communities in the digitalization process. The close involvement of the community allows members to gain digital skills throughout the process of establishing and maintaining the network. The Internet Society is supporting the establishment of the first community network in the MENA region in the province of Hadramout, Yemen.[34]

Community networks can work in a number of ways. However, one key component is access to

spectrum. Different bands of spectrum, the radio frequencies used to operate mobile networks, are typically auctioned and exclusively licensed to specific operators. This exclusionary allocation often leads to underutilization and means companies can effectively deny spectrum to regions where they choose not to expand.[35] However, governments can also designate specific bands for unlicensed use, and can adjust this space to allow for community networks to establish. There are also options for shared use, and even secondary market

agreements with incumbent operators, allowing access to spectrum for minimal fees.[36] Ultimately, the costs of establishing these networks can be prohibitive, especially the cost of backhaul infrastructure needed to connect to national backbone networks.[37] However, with the right financing and regulatory support, especially from donors, community networks can become vital links and channels of self-sufficiency to millions excluded from the digital economy.

BOX 1

Community Networks

In 2014, Mexico passed the Federal Telecommunications and Broadcasting Act which added new concessions for the use of spectrum. The new law allowed spectrum for social community use, awarded to non-profit and civil society organizations and for indigenous communities, provided that they would serve 2,500 people or less or were located in indigenous zones.[38] The country's telecommunications regulator set aside part of the spectrum known as the cellular band (between 824-849 MHz and 869-894 MHz) and issued guidelines to obtain this type of concession. Since the law was passed, Rhizomatica, an organization that builds rural community networks, set up new networks in Oaxaca and today helps provide service in 20 communities with a total population of 24,299 and 3,000 users.[39]

The Middle East has a long road ahead to catch up with digital infrastructure, but the benefits of investment in improving national core networks cannot be understated. Improving fiber connections to population centers can make data centers and IXPs more affordable, thus lowering latency, cost, and increasing usage among consumers. Community networks can provide empowering linkages to millions in isolated communities. These changes must be made to provide access to more sophisticated content. Among the most common forms of internet content today is high bandwidth

video, which has become essential for distance learning and improving digital skills for everyone.

Digital Skills

Understanding digital skills is an important way to assess the scale and impact of digital technologies on growth. Despite relatively high mobile and mobile broadband penetration in the MENA region, the lack of digital skills is one key component of the internet usage gap. Skills at basic levels allow merchants, students, and all general users to benefit
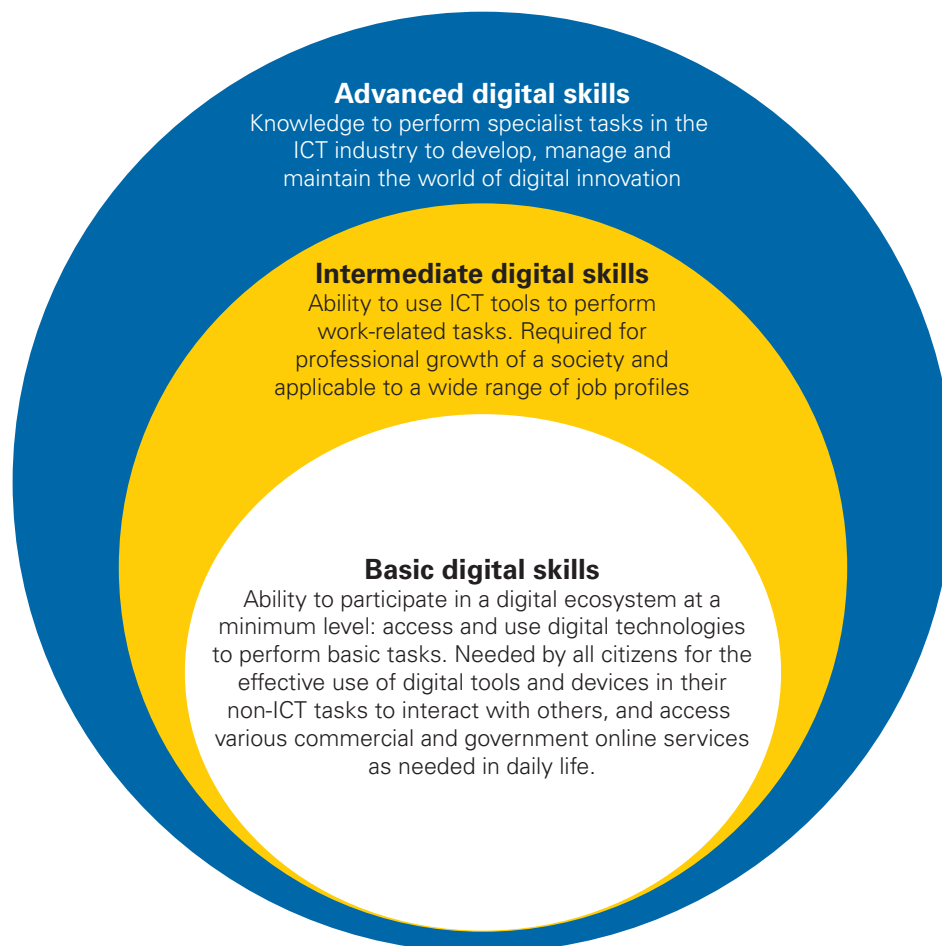
from the internet and devices, and IT professionals with advanced digital skills can update the infrastructure and innovate. As it stands, skills and affordability are the primary barriers to meaningful connectivity throughout the region.

Digital skills can be understood as the level of sophistication by which individuals use Information and Communications Technologies (ICT). Both the ITU and the European Commission[40] have developed their own ranking system for digital skills, arrayed from basic (word-processing and email) through advanced skills (Artificial Intelligence

[AI] and cybersecurity). However, skill levels are unevenly distributed and limited throughout the region, reflecting where the internet is accessible. For example, basic proficiency is most prevalent throughout the Gulf; in the United Arab Emirates (UAE) for example, 72.3 percent of the population has basic proficiency, 60.4 percent standard, and 18 percent advanced.[41] However in Tunisia, where a rather large percentage have advanced skills (16 percent), only 20 percent have basic skills, reflecting unequal internet access and a lack of ICT integration in schools and broader society.[42]

Figure 3: Digital skill sets for digital skills and inclusion

Advanced digital skills
Knowledge to perform specialist tasks in the ICT industry to develop, manage and maintain the world of digital innovation

Intermediate digital skills
Ability to use ICT tools to perform work-related tasks. Required for professional growth of a society and applicable to a wide range of job profiles

Basic digital skills
Ability to participate in a digital ecosystem at a minimum level: access and use digital technologies to perform basic tasks. Needed by all citizens for the effective use of digital tools and devices in their non-ICT tasks to interact with others, and access various commercial and government online services as needed in daily life.

Source: Baca-Feldman et al. (2021). "Digital Skills Insights 2021." International Telecommunications Union. Geneva. Pg. URL: https://academy.itu.int/main-activities/research-publications/digital-skills-insights/digital-skills-insights-2021

Professional training for advanced digital skills may generally be obtained through a post-secondary course of study. Many of these skills, including AI, cloud computing, big data, cybersecurity, virtual reality, and the internet of things, are considered integral to the fourth industrial revolution (4IR) and therefore to innovation and economic growth. Ideally, educational and tertiary institutions should provide the skilled professionals needed to build out the digital infrastructure and digitize the private sector, government, and social institutions. Basic digital proficiency will determine the degree to which society uses these tools efficiently in the workforce. But as we argue, the current skills pipelines in MENA are insufficient at all levels.

Skills shortages

In terms of advanced, professional skill sets, there is a persistent global shortage. According to consulting firm Korn Ferry, every region of the world is under-producing in this field, leading to losses in potential growth. Saudi Arabia and the UAE will lose $50 and $200 billion respectively in output by 2030 if they do not close this gap – even more if they continue to fall behind.[43] In a PricewaterhouseCoopers (PwC) survey of executives in the Middle East, 81 percent responded that the lack of needed skills is a major threat to expansion.[44] This persistent shortage explains national drives to increase output of professionals knowledgeable in 4IR skills through special training programs or tertiary courses. However, training at universities in MENA typically falls short of private sector needs, amounting to a ubiquitous skills mismatch prevalent in regional labor markets.[45] Furthermore, many of these skills and complementary skill sets are more oriented toward vocational training systems. However, this branch of education in the Middle East is traditionally neglected and in need of a major overhaul.[46]

Furthermore, many more workers will require elementary training in digital skills in order to adapt to the changes to their jobs. For example, healthcare and public health workers (also a key area of growth in future job markets) need digital skills training in order to interpret health metrics and leverage developments in e-health.[47] To this end, the World Health Organization (WHO) assessed the use of distance learning to expand healthcare workforce capacity and emphasized the need to enhance digital skill proficiency.[48] Further, a global

> Saudi Arabia and the UAE will lose $50 and $200 billion respectively in output by 2030 if they do not close this gap.

McKinsey survey of CEOs found that employers are focusing more on training and reskilling their current workforces than hiring after the pandemic – among the biggest areas in need of improvement according to the survey were basic digital skills.[49] Recognizing the importance of basic digital skills extends to youth as well. According to an evaluation of career development centers in Iraq by the International Research & Exchanges Board (IREX), computer applications and entrepreneurial skills were identified as the most valuable to students.[50]

Evidently, although mobile coverage and ownership in MENA are widespread, the distribution of digital skills requires discrete effort. Low internet use and affordability in some areas reflects a lack of incentives for skilling efforts. In principle, an introduction to using ICTs should occur in elementary school and progress onward. However, the mainstreaming of digital skills in schools in the region is uneven. Secondly, those that grew up

before the introduction of ICTs become left out of the digital transformation. Adult literacy centers, which are prevalent in the Arab world, began offering introductory digital skills courses, but do not reach all in need.[51] All these activities were interrupted by the pandemic and though conditions forced many people to gain familiarity with digital devices, a lack of preparedness also had significant impacts on communities.

Distance learning

The impact of limited digital skills and infrastructure became clear in schools which were among the first institutions to shut down when the pandemic hit. The World Bank estimates that schoolchildren in MENA have already lost an average of 0.6 years of learning due to closures.[52] SSchools were ill-equipped for the sudden transition to distance learning. As al-Nasrawi explained, "The education emergency response during the early phase of COVID-19 focused on implementing remote learning modalities. These were intended to reach all students but were not always successful and the existing infrastructure played a central role in making this experience bad, average or excellent." Instructors suddenly needed digital skills to begin recording and disseminating lessons over television or internet with new equipment. They also had to adapt courses for students who had varying access to the internet or end devices.[53] Lastly, not all students had the same level of digital literacy, and a lack of prior training impacted how well they could utilize the new tools.[54]

Despite the relative success in keeping education active, the low preparedness for distance learning was one factor forcing policymakers to consider reopening schools early. Learning losses among poorly connected communities may be even

larger than current estimates suggest. Given schools systems were forced to rapidly implement distance learning, arrangements were made without regulatory adaptation. Fabio Nascimbeni from the European Training Foundation noticed this "non-linear" policy cycle and education systems experiencing "change without reform." Once distance learning is introduced, many questions follow, including the choice of platform, the skills required for learners and teachers, the relevance of the content, the need to innovate assessment, and the availability of devices.

Of course, the question is not simply one of providing infrastructure, but achieving meaningful connectivity. Beyond providing service range and devices, this means increasing usage and designing services to suit the population's needs. Nascimbeni explains that for "infrastructure and connectivity, accessibility should be actually the starting point for the broader inclusion policy discussion instead of a policy objective," and should start other conversations on pedagogy, content, and teacher training. Some countries set up national portals for distance learning that build on the national curriculum, such as Darsak in Jordan. Others, such as Morocco, began broadcasting lessons on national television. However, these developments do not fully account for those less connected or at different levels of digital skills, and there are many more steps governments and educators need to take once a distance learning medium is adopted.

ICT professionals

The pandemic induced a steep demand for ICT work and related skills in schools and for other institutions.[55] Despite increasing needs, universities providing advanced digital skills have consistently underperformed. Numerous interviews for Wilson

Center research confirm the frequent complaint that university training for IT technicians and other technical professions is outdated, overly theory-based, and increasingly irrelevant to the market. In light of a "huge digital skills gap", the Covid-19 pandemic "has emphasized the need for affordable, accessible, market-driven and inclusive solutions to provide individuals with the digital skills," said Jihen Boutiba Mrad, secretary-general of BUSINESSMED, the Union of Mediterranean Confederations of Enterprises.

Recognizing the poor output, numerous institutions have begun providing remedial digital skills training to graduates to enhance the applicability of their skills. Int@j, The Information and Communications Technology Association of Jordan, facilitates many of these bootcamps focused on giving graduates more applied technical experience as well as basic professional skills. As Nidal Bitar, director of Int@j, explains, "… a majority of these universities are not graduating the level that the industry is looking for. That's why we believe these bootcamps are very important, and they have been doing a great job. We see graduates of many of these bootcamps... transform 180 degrees."

Tailoring IT courses to meet market demand and international certification standards such as Capability Maturity Model Integration (CMMI) is critical. However, several of our interviewees worried the main deficiencies go beyond digital skills and lie in essential and management skills. Christine van den Toorn, founder of Baghdad Business School, explained, "I don't think that we can just teach these students... UI, UX or just teach them accounting and finance… what we're trying to do is give them analytical tools, proactive, engaged attitudes in this program while also giving them some basic skills."[56] This practical skill set was consistently cited as the most pressing need among private sector employers. Laith Al-Qasem, chief executive officer of the Innovative Startups and SMEs Fund in Jordan, also pointed out that "a lot of the skill sets that I think are missing are much more management related than they are technical. I think we can find plenty of technically skilled people, but I don't think we find enough managerial people who can organize and focus their efforts towards achieving something."[57]

BOX 2

The Station, Iraq

This triple need for IT talent, essential skills, and managerial skills is epitomized by The Station, a startup accelerator and co-working space in Iraq. In 2021, The Station launched "The Academy", in which it offers a full suite of essential skills, critical and design thinking, and technical training for applicants to launch their businesses. Ashley Barlow, executive director of The Station, emphasized that graduates need special introduction to critical thinking because they struggle to come up with original ideas.[58] He expressed how university graduates require a remedial introduction to basic research and essential skills in order to be successful in the program. Those that succeed in the early stages at the Academy move on to train in specific digital skills that are applicable to their business ideas through the Station's networks of industry professionals and trainers. Several finalists from the program are given access to funding and to The Station's coworking space.

The Station creative industries hub and creative spaces, Baghdad, Iraq. Photo courtesy of Ashley Barlow.

As countries seek to develop their ICT infrastructure and place the internet in the hands of more and more citizens, a concentration on digital skills is crucial. This upskilling requires consideration for students as well as older generations that may be using the internet for the first time. Furthermore, an emphasis on basic digital literacy should not be disregarded, and many employers are currently seeking to enhance basic digital skills for their workforces. Therefore, a lack of digital skills limits the growth potential of expanding the digital economy. But MENA countries face a long road to improve output of skills from universities in multiple ways: in addition to poor applicability of IT skills, the universal lack of essential skills is a tremendous drag on employment. Therefore, educators and regulators will have to address the way these skills are conveyed and increase their exposure earlier in the education timeline. Only then will the MENA region be able to produce a dynamic workforce capable of competing in the fourth industrial revolution.

Digital Economy & Employment

At the heart of MENA's digital transformation is the ambitious drive for growth in the digitally-enabled economy and its potential to create hundreds of thousands, if not millions, of jobs directly and indirectly. This comes against the backdrop of a continuous (youth) unemployment crisis in the MENA region.

As economic growth is projected to gradually pick up again,[59] governments will need to ensure any measures that have improved accessibility during the pandemic will be turned into long-term policy. Further, as discussed, proactive efforts to increase internet speeds and access could actually drive growth higher. However, many countries will face an investment challenge. According to IMF projections, government debt will stay above 50 percent of GDP in the MENA region overall and over 90 percent of GDP among the region's oil importers.[60] Many countries were forced to borrow to cover emergency spending during the pandemic, while growth simultaneously contracted. Much of

that financing came from domestic banks, which reduces the capital available to the private sector, and leaves governments with less fiscal space to subsidize internet access for disadvantaged groups. Without a good investment environment, gaps in internet coverage and use will continue to hold the region back, especially if pandemic borrowing becomes bad debt.

The digital economy's impact on growth

Access to the Internet brings economic benefits in terms of contribution to GDP by digitally enabled jobs, the creation of new and high-quality jobs and the ability to conduct business across borders more efficiently. The contribution of ICT to GDP varies from country to country, but generally ranges between 0.5 to 6 percent, reflecting the nascent status of the region's digital economy.

Various studies have showcased the positive effect of Internet adoption on economic growth. A 2018 ITU study estimated that a 1 percent increase in mobile broadband penetration leads to an increase of 0.15 percent in GDP, while the same increase in fixed broadband adoption leads to a 0.08 percent GDP increase. The authors concluded that mobile broadband overall "appears to have a higher economic impact than fixed broadband", while also highlighting that the impact varies according to different levels of economic development in a country. Accordingly, fixed broadband has a higher economic impact in more developed countries, whereas the impact of mobile broadband is higher in less developed ones.[61]

Among sampled MENA countries, one study estimated that the digital economy's contribution to GDP varied between 0.4 percent in Qatar and 8 percent in Bahrain.[62] According to GSMA, "[m]obile technologies and services generated 5.7 percent

Faster internet in some economic sectors also increased productivity and appeared to enable exporting.

of GDP in MENA in 2019," amounting to more than $244 billion of economic value added. It estimated that the mobile industry also supported around one million jobs directly and indirectly.[63]

Studies on other regions are also insightful when considering the economic impact of digitalization. A 2019 study on the impact of the arrival of ten submarine internet cables from Europe to Africa found "a significant and large relative increase in the employment rate in connected areas when fast internet becomes available."[64] The authors highlight an increase in employment in higher-skill jobs, a finding that is particularly relevant for the MENA region, as unemployment among university graduates is high. Faster internet in some economic sectors also increased productivity and appeared to enable exporting. The authors find that in the 12 African countries studied, the arrival of fast internet led to a rise in incomes in connected locations, while noting that this effect "may be especially large" in the first several years after the arrival of the submarine cables.

Internet affordability is another key consideration for policymakers trying to foster the growing digital economy in the MENA region. A 2021 study addressing broadband affordability in the US found that the availability of cheap broadband Internet access through Comcast's Internet Essentials program led to an 8.1 percent increase in the likelihood to be employed among enrollees.[65] The author also found that the probability of being unemployed decreased when enrolled in the program, and incomes rose by around $147.

According to a Comcast survey, 62 percent of surveyed participants indicated "that the program had helped them or a family member find employment."[66]

As affordability remains a significant barrier for low-income households, especially in MENA, designing a program similar to Internet Essentials, while also considering the prevalent digital divides, could help lower the persistently high unemployment rates in the region. Internet access can accomplish this in several ways. Firstly, it can make it easier to search for job opportunities in nearby markets. It also enables people to freelance and work from home. The internet also gives people the opportunity to access education and training opportunities as distance learning spreads across the region, thus improving their employability and incomes. For MSMEs, internet access makes it easier to communicate with potential customers and sell goods and services domestically and internationally. For fast-growing businesses, the rise in remote working allows them to hire more quickly and flexibly, for short-term and part-time contracts as well as for full-time permanent employment.

Covid-19 and the startup economy

The impact of Covid-19 on the region's digital economy has been mixed. With few exceptions, MENA economies entered negative growth. According to the International Labor Organization (ILO), Arab states in 2020 lost the equivalent of 5 million full-time jobs. On the other hand, the pandemic forced many people to use the internet for the first time and sparked interest in areas such as education technology, digital payment solutions (fintech), online retail, and online healthcare solutions.

Despite the pandemic, MENA startups raised more than $1 billion in funding in 2020 while the number of deals declined.[67] In July 2021 alone, MENA startups raised $632 million across 77 deals, according to Wamda, with the vast majority going to cloud kitchen operator Kitopi ($415 million).[68] A recent estimate by Redseer said the MENA region's digital economy would more than double to $100 billion by 2023, stressing that online retail will play a key role in that projected expansion.[69] Another key area of growth essential to the digital economy are digital payments (i.e. fintech), which took 30 percent of new money raised in 2021 - led by Saudi fintech startup Tamara, also according to Redseer. Since the start of the pandemic, more consumers in Saudi Arabia and UAE declared their intent to continue shopping online.[70] Digital payments will increase more slowly in poorer, and less connected countries like Iraq, where people show a strong preference for cash, but innovations like digital wallets offered by telecom providers provide an alternative to bank accounts.

As investment continues to flow to fintech, firms will innovate ways to access unbanked populations, and international e-commerce companies are flooding in. In September, American retail giant Amazon announced that it was relaunching Souq.com as Amazon.eg in Egypt, the MENA region's largest consumer market by population.[71] Crown Prince Hussein of Jordan attended the launch of Amazon's new corporate headquarters in Amman in November and the company announced it was building 11 new facilities and adding 1,500 jobs in Saudi Arabia earlier this year.[72] Amazon Web Services and other US tech companies like Microsoft and Cisco have increased their presence in the region in the last few years, setting up data

centers and cloud storage facilities - acknowledging the growing digital needs of firms and households.

MENA startups will not be able to solve the region's unemployment crisis alone, particularly amongst youth, but they can serve an important function in the economic recovery by providing jobs for highly-skilled graduates in the private sector. Moreover, while technology startups rely in part on employees with advanced digital skills, they also create jobs which require a lower level of technical knowledge, e.g. for data entry or the digitally-enabled fulfillment of logistical tasks. As growth in the digital economy expands, other firms will also benefit from the lower transaction costs and flexible labor scenarios, potentially leading to more jobs and an increased need for digital skills. As stated above, more CEOs are interested in increasing the basic digital skills of their employees at all levels. Furthermore, by creating attractive jobs, startups can also contribute to promoting circular migration, enticing skilled individuals that have moved abroad for education and work to return to their home countries permanently or temporarily where they can help revive the economy.

"Digital transformation offers our youth, our men and women entrepreneurs and all our well-educated population an opportunity to innovate, create value, export services and grow globally from anywhere in Lebanon despite the physical and capital constraints.

In order to achieve that, the priority is to support our unique and human capital and accelerate its growth with an efficient and enabling working environment: political stability, solid infrastructure, conducive business ecosystem, ease of doing business and access to risk capital and competitive incentives for investors and entrepreneurs."

Adel Afiouni, *former Lebanese minister of state for investments and technology*[73]

Digital economy and workers

Some also see an opportunity for ICT graduates from the region to help fill the shortage of skilled IT workers in Western countries. In Jordan, for example, around 5,000 students graduate in IT-related fields each year, but less than 2,000 are hired, thus producing a surplus of graduates, according to Bitar of Int@j". In order to achieve that, it is necessary to identify what skills are in demand and what qualifications are needed in other markets and match them with local companies and IT graduates.[74]

Beyond technology-driven startups, MSMEs could also benefit greatly from digitalization.[75] However, many would need government and donor support to enact this change, which could serve as a gateway to wider digital transformation.

As discussed, the lack of managerial and English language skills are significant barriers to growth in the ICT market. According to the Global Entrepreneurship Monitor's latest report, entrepreneurial education at school and post-school (i.e. post-secondary school) is poor in several Arab countries, particularly in Morocco, Egypt and Kuwait. However, scores

in these areas vary across the region and these negative results stand in contrast with positive scores in several Gulf countries, with Qatar ranking fourth and sixth of out 45 surveyed countries globally in terms of entrepreneurial education at school and post-school respectively.[76, 77] These findings also highlight the potential for the sharing of best practices between MENA countries. Critical thinking and essential skills are at the heart of this training. The persistent gap in this area has brought about a need to hold remedial training courses for (potential) recruits and undermines the region's digital growth potential.[78]

Business environments across the region vary greatly, but common criticisms by startups and established businesses include the following aspects: regulation is burdensome and it remains difficult in many countries to quickly establish a business, particularly a technology-based one. The latter is also related to the fact that public employees often have not been trained to deal with the specificities of tech startups. Another point of criticism is that banks have often been extremely hesitant to grant loans to digital businesses, as the latter cannot offer collateral, e.g. in the form of buildings or vehicles. This approach has made it harder for digital businesses to access traditional forms of finance, thus jeopardizing their ability to grow and hire people.

The Role of Donors

Donors and civil society organizations play a crucial role in making sure that underprivileged regions and populations are equipped with at least basic digital skills and resources in order to improve their livelihoods and chances of employment. According to this analysis, there are two core areas

where donor support is the most needed: last-mile development and digital skills support.

One goal of donors should be to make sure that quality and consistent internet services reach the most marginalized people. As discussed, usage gaps are primarily explained by pricing barriers and poor infrastructure development, in addition to skills deficits. Donors can support those that live in range of mobile networks or fixed connections by providing access to devices and demand side subsidies or prepaid plans to lower the cost of broadband bundles to consumers. They can also assist in the creation of community access hubs, where users can access fast and stable internet in a central location.

Where last-mile connections do not exist, donors can play a key role in establishing community networks. As discussed, these networks are ones in which communities cover the cost of connecting to the national network themselves, but they need the financing to connect to the national backbone and to provide the end-use access infrastructure, usually mobile towers. Donors can lower the barriers by contributing financing, and also increase employment by training locals on how to maintain the infrastructure. If locals can provide the upkeep, they can preserve their access to the internet without requiring pricing schemes determined by ISPs. Donors can also be critical in articulating the reforms required to allow rural communities access to spectrum.

Lastly, donors play an important role in providing skills support. Often, skills are the first thing neglected when providers enter new markets, as no entity can make a direct return on investment by offering basic training. But digital skills are critical for improving the quality of user experience

and allowing locals to leverage the internet for their self-improvement. Skills can allow people to access critical resources that are beyond reach, such as distance learning. They can also provide technical skill sets, allowing IT talents to emerge from underserved areas - thereby supporting employment.

Financial and logistical contributions by donors can also make a big impact when it comes to tackling the prevalent digital divides. Local civil society organizations across the region are working to address these issues, but often lack the funding and reach necessary to make a nationwide impact. A whole range of actors from governments to businesses and civil society organizations are offering digital skills classes, but those offered for fees are often out of reach for underprivileged populations. Donors have in various cases funded digital skills development programs trying to bridge the digital divide.

BOX 3

Donor funding for Code Circle to reach underprivileged girls

Code Circle is a Jordanian company offering coding, design and entrepreneurship classes taught by industry practitioners, founded by two women - Ruba Asfour and Jida Sunna. Traditionally, participants need to pay for classes, which can exclude children from low-income households. One of the goals of the organization is to get more girls and young women interested in STEM subjects, and for this they partnered with a local donor, the Abdul Hameed Shoman library, to establish the Code Café[79] initiative, which serves women and girls outside of Amman in underprivileged areas: The donor provided funding to teach 130 girls across Jordan programming languages, paying for the participants' fees, the teachers, the food and transport. Reaching these marginalized areas with the support of donors, "you can inspire so many people," said Ruba Asfour, co-founder of Code Circle. Another initiative, the Code+[80] program, was supported by CTEK, a US NGO with a mission "to break down barriers to entrepreneurship worldwide. [81]
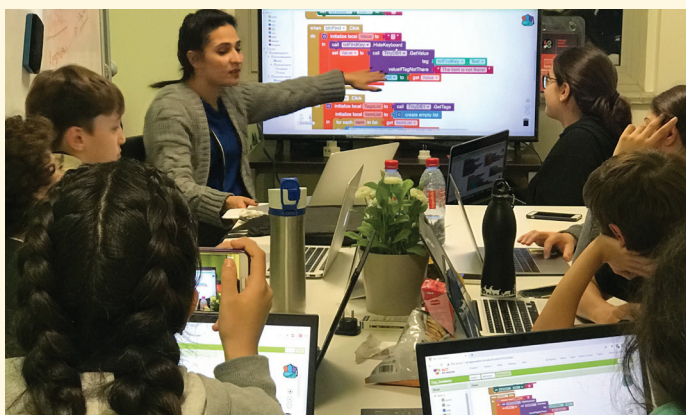
App development course for ages 9 to 12. Code Circle uses drag-and-drop "block coding" exercises to teach coding to children.

Credit: Courtesy of Code Circle

However, while donor money can be pivotal to fund programs for underserved areas, their approach thus far, according to interviews with local stakeholders, has often been ad-hoc and overly focused on a series of short- to medium-term projects rather than long-term partnerships with local organizations as part of a wider digital transformation strategy. (It must be noted that various important development actors like the European Union and USAID have developed or are in the process of developing new, comprehensive digital transformation strategies.)

Donor interventions are most successful where they have a positive impact after a singular project or program ends, by strengthening local capacities to continue the work of, for example, teaching digital skills to girls and other underprivileged groups. This involves efforts to build longstanding partnerships alongside long-term funding mechanisms supporting local partners. That way, donors can facilitate change by empowering local agents to carry out the work in the long run.

Part of establishing such a system is recognizing that the status of the digital transition in each country is unique despite regional commonalities, and thus requires a tailored approach. While the Tunisian Startup Act for example can serve as a great model for other countries, it needs to be adapted to local conditions.[82] This adaptation process involves a bottom-up approach, involving local stakeholders at all stages of the design and implementation of a program.

As the digital transition has increasingly become a focus area for many donors, there is an urgent need to improve coordination to avoid the duplication of efforts.

Conclusion

Expanding access to the internet and investing in the MENA region's digital economy should be a key part of regional governments' economic recovery strategies. As cited above, broadband expansion comes with economic benefits, but extending coverage alone is not enough, and governments and their partners need to focus on making the internet more affordable. The digital divides in the region have created a new layer of inequality, one that was on stark display during the pandemic when governments closed schools, ordered people to work from home and imposed curfews.

The MENA region's digital infrastructure needs further investment and reforms to create competition in the telecommunications sector. One aspect of improving the digital infrastructure is to increase the number of data centers and IXPs, which can enable countries to increase internet speeds and bring down costs. Any policies to expand the digital infrastructure should involve consultations with local communities (see the example of community networks above), granting them a stake in the digital transformation and thus making it more likely to close the internet usage gap that is prevalent in the region.

Efforts to make internet access more affordable also need to be accompanied by policies to expand and reform digital skills development from an early age and also emphasize continuous training for workers. Universities need to address the applicability of their ICT curriculums, in order to make graduates better prepared to work in the private sector. Beyond digital skills, there is a need to improve the teaching of language and management skills to transform the growth of IT businesses. As outlined in the recommendations below, driving forward the digital

transformation process in the MENA region in a more inclusive manner requires more collaboration between governments, donors, private sector businesses and civil society organizations.

Recommendations

The following recommendations are based on primary and secondary research for this working paper. As outlined above, ensuring greater access to affordable Internet and digital skills development as an economic recovery strategy requires the close collaboration between all the different actors. Nevertheless, the different stakeholders each bear a unique responsibility to work towards this goal.

Governments:

- Permanently lift the ban on VoIP services such as WhatsApp, Skype, and Zoom.

- Mainstream digital skills and essential skills in public education.

- Improve English language, critical thinking, and entrepreneurial skills at the university level.

- Reform curriculum of ICT diplomas to emphasize real-world application, private sector needs, and experiential learning.

- Expand and invest in vocational training options for ICT careers.

- Modify regulation to allow for unlicensed and shared use of spectrum.

- Reform regulations to allow for private competition between telecom providers.

- Improve the cost-effectiveness and speed of broadband by investing in fiber optic networks, data centers, and IXPs.

- Implement national broadband plans that include demand-side subsidies for low-income families.

- Create a system for multi-stakeholder collaboration, involving government agencies (whole-of-government approach), the private sector, civil society and donors.

- Improve bankruptcy and liquidation proceedings for (digital) businesses and offer them more opportunities to obtain funding.

- Reduce the land and office space requirements for starting businesses and qualifying for tax incentives.

Private sector:

- Invest in basic and advanced digital skills for employees.

- Promote a culture of continuous learning, especially through distance learning.

- Set up internship opportunities for students and graduates in collaboration with universities.

- Work with the regulators and educators to update ICT and management curricula in schools, universities and TVET schools.

- Where possible, invest in digital infrastructure and fixed fiber connections for offices.

- Share spectrum and create secondary market agreements with community networks aiming to connect underprivileged areas.

- Work with the government and donors to expand opportunities for digital startups to qualify for loans and reduce collateral requirements.

Donors:

- Expand support for digital skills development programs, particularly ones targeting underserved areas and groups.

- Fund bootcamps to re- and upskill graduates to close the skills gap and increase their chances of finding employment.

- Establish initiatives that lease or sell reduced-price devices to access the Internet.

- Work with local partners to provide communal facilities with fast Internet access.

- Establish long-term and equal partnerships with local civil society organizations that emphasize digital transformation over specific projects.

- Invest in local infrastructure for community networks and finance backhaul connections to network cores.

- Emphasize closer coordination between agencies and NGOs to avoid the duplication of efforts.

- Improve their coordination with the local private sector.

- "De-risk" investment in the digital economy by providing guarantees to incentivize local banks to lend to local IT businesses (this has been done by the European Bank for Reconstruction and Development).

- Expand programs to aid the knowledge exchange between MENA countries and their partners, such as joint research institutions, business exchanges and mentorship programs.

- Facilitate access to foreign markets by helping navigate local requirements to conduct business or helping them set up a local representative office.

The opinions expressed in this article are those solely of the authors.

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