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Policy Brief

A CLOSER LOOK AT G20'S FUTURE OF WORK IN THE DIGITAL ERA

Task Force 5
Inequality, Human Capital and Well-being

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Abstract

The future of work in G20 countries, represented by the youth workforce, faces various challenges in the digital era. Navigating technological advancement remains a challenge for developed and emerging economies alike. Digital divide, suboptimal education, and unequal opportunity for marginalised communities emerged as the concurring challenges among G20 countries. To address these challenges, high quality and adaptive education towards digital transformation, digital literacy for all, inclusion and protection of marginalised groups, as well as digital-based incubators are proposed as recommendations.

Keywords: G20 countries, future of work, youth unemployment, workforce, digital transformation, digital literacy, inclusion, marginalized groups.

Challenges

The future of work in G20 countries, represented by the youth workforce, faces various challenges in the digital era. Although not all G20 countries are experiencing demographic dividends, youth unemployment is a shared issue (OECD,2015; ILO 2020). Navigating technological advancement—such as automation, artificial intelligence, and the Internet of Things (IoT)—remains a challenge for advanced and developing economies alike as it threatens existing jobs despite being predicted to open millions of new ones (McKinsey, 2019). Furthermore, most of the workforce in the G20 countries are low to mid-skilled labourers[1] (European Courts of Auditors, 2021; OECD, 2018; World Bank 2020). Despite general increase of educational attainment, laborers' skills or proficiency do not improve as much as expected (Almeida and Packard, 2018; OECD, 2018; UNESCO 2018)[2] and worsened due to learning loss brought by COVID-19 (Carrasco, et. al., 2021; Allotey, et. al., 2021)[3].

On the other hand, digital divide[4] experienced by marginalised communities, including women, girls[5], and people with disabilities (PWDs)[6], remains a widely occurring phenomenon tied to

[1] According to Elliot's Study (2017) from OECD (2018), around 30% of the workforce in several G20 countries (US, Turkey, UK, Canada, France, Italy, Korea, Germany, Australia, and Japan) have general cognitive skills (literacy and numeracy) at or below the level of computer capabilities. This number is estimated to increase to 60-70% by 2026 in line with advances in computer capabilities. The low level of labour skills related to digital systems also occurs in other G20 countries, such as the EU (European Courts of Auditors, 2021) and Indonesia (World Bank, 2020).

[2] Around 47% of 617 million (globally) children and adolescents in primary and lower secondary school who do not achieve minimum proficiency levels in reading and mathematics (UNESCO, 2018) reside in G20 countries. In addition, most children and adolescents not learning are actually in school as the percentage of adolescents (26%) outnumbered the percentage of out-of-school children (23%).

[3] Due to COVID-19, school learning is altered by online learning. However, the method raises issues regarding the digital divide. Digital divides may be caused by several factors including territorial characteristics (density, demography, and proximity to cities); socio-economic factors (gender, age, skill level); and firm characteristics (OECD, 2021a).

[4] Digital divide occurs across three layers of dimensions: the network or connectivity; the application interfaces and data; and the end-user (OECD, 2021). The main issue of the digital divide lies in the first layer, as network or connection availability affects data development and the digital skills of the end-user.

[5] Some rural communities in northern India, for instance, have outright prohibited women from using mobile phones, while others have issued decrees declaring internet use "immoral" for women (GSMA, 2019).

[6] ICT products or services such as accessible websites, text-to-speech, screen readers, and alternative input devices (head-trackers, joysticks, etc.).

digital literacy[7], access to digital infrastructure, and digital skills attainment that are relevant to future works (Intaratat, 2022). Many young people with sufficient infrastructure and access possess low digital literacy. Jobs that require strong technical and technological skills are already flourishing, especially in the health, technology, STEM, transportation, finance, business, and legal industries (OECD, 2020; McKinsey Global Institute, 2021).

Yet, young people are online only for consumptive purposes, and risk falling victims to frauds, hoaxes, breaches of privacy, and other cybercrimes (See Box 2). The COVID-19 pandemic also exacerbates such risks as online activities are strongly encouraged at home and school settings (Pandya & Lodha, 2021). Moreover, the quality of digital literacy and education framework is not equal among G20 countries. There is no mutual definition or standard agreed upon as a framework that is tested to grasp and compare the level of workforce literacy and competence. It is unfortunate, as the mutual standards may open more opportunities for the policymakers to design well-tailored policy (Chetty et al., 2017).

As the current economic landscape is getting increasingly digitalized, cybersecurity is also an aspect that needs to be discussed. The digital economy accounts for 15 percent of global GDP and four billion people worldwide use the internet to work (Statista, 2021). Yet, human resources in the cybersecurity industry are also overly stretched, causing a zero-unemployment rate (McCreary, 2018) that increases the risk of skills inadequacy and exertion. Not to mention, the "brain drain" (ILO, 2021) phenomenon persists as huge skills and capacity gaps between countries are widening, causing developing countries to fall further behind as they are deprived of highly skilled resources and fair revenue.

Efforts to directly intervene with these gaps, such as digital-based incubator programs, face challenges. Outside of Europe and North America, a high proportion of adults (18-64 years old) report knowing someone who had started a business because of the pandemic. In all of the Latin American and Caribbean countries (except Uruguay) surveyed, **more than half of adults claimed to know someone who has started a business as a result of the pandemic,** as they do in Indonesia, Angola, Oman, and India (GEM, 2021). Unfortunately, although the number of start-ups has risen dramatically in the United States (Newman & Fikri, 2021), especially during the pandemic, digital incubators are struggling to find young entrepreneurs with sufficient financial knowledge and strategic vision. It is also hard to scale up these start-ups and Small Medium

[7] According to UNESCO (2018), digital literacy encompasses 5 main competency areas (information and data literacy, communication and collaboration, digital content creation, safety, problem-solving) and 2 additional competency areas (devices and software operations and career-related competencies).

Enterprises (SMEs) in emerging economies as they have limited access to the market outside of their local area (Bosma et al., 2021).

Proposals for G20

To address these challenges, this policy brief maps out five aspects of recommendations to be proposed:

1. High quality and adaptive education towards digital transformation

1. G20 countries should establish policies that encourage actors in digital infrastructure (e.g., providers and investors, including government entities) to create high quality and affordable communication services in low demand and high-cost areas. Governments can adopt best practices (see Box 1) to boost digital transformation in education that is much needed in this Covid-19 era in which school closures are widely happening.
2. Besides digital infrastructure, school curriculums should equip students with skills that allow them to remain adaptable in an ever-changing job landscape in the future. As some occupations will be replaced by automation, information and communications technology (ICT) and cognitive skills-oriented curriculum also need to be balanced with complementary skills, such as problem-solving, decision-making, and interpersonal skills that are fundamental in the working environment. In addition, adopting problem or project-based learning methods blur the boundaries between disciplines and promotes flexibility that allows smooth transitions between learning and working[8]. This method will allow students to improve current skill-building and match individual capabilities with industry needs. One example of an industry in which workforce is direly needed is the cybersecurity industry. The cybersecurity industry is experiencing a zero-unemployment rate, with demand for the workforce projected to grow 145% globally (Maurer & Nelson, 2020). Two ways to tackle this problem are to expand the capacity of existing resources and increase the number of skilled laborers. Employers could retrain the existing workforce and include people without computer science backgrounds. As 98% of cybercrime relies on social engineering to be successful (Firch, 2021), people with backgrounds in security studies, behavioural science, sociology, and others will be suitable candidates to answer the labour shortage.

[8] Unlike traditional learning models that are identified by short-term practice, insulated, and teacher-centred, Project-Based Learning focuses on learning activities that are long term, comprehensive, interdisciplinary, student-centred and integrated with the practice and real-world issues (Indrawan et al., 2018). Project based learning stimulates motivation, process, and improve the academic performance of students by adopting related issues on the real situations (ibid.).

3. Curriculum development must be made aligned with teacher upskilling programs that keep them updated on technological advancements. This can be done through fundamental digital skills training, increasing access to digital technology, and introducing innovative digital learning processes for teachers. Teachers are expected to increase students' digital literacy and minimise the adverse effects of technology in the learning process[9].
4. The G20 countries should increase the scope and variety of training programs around digital transformation and relevant technology—such as Artificial Intelligence (AI), blockchain, Internet of Things (IoT), cloud computing, and cybersecurity. These programs should include technical and non-technical skills which are current, relevant, readily applicable, and accessible by all levels of society. Through that, reduced skill gaps between G20 countries, easier workforce mobility, and more knowledge transfer are hoped to occur. The government, alongside the industries, also needs to develop national work competency standards that include aspects of knowledge, skills or expertise, and relevant work ethics to maximize the impact.

Box 1: Examples of intervention in providing equal access to digital infrastructure

Increasing connectivity: To decrease the digital divide due to infrastructure gaps, the Brazilian army in collaboration with the Ministries of Defense, Health, Education, and the Communications Federative Republic of Brazil conducted The Amazônia Conectada Project, which aims to provide 8,000 km of fiber optic cable to ensure efficient and reliable internet connection.

Providing learning devices and data packages: Several G20 countries, through Federal and Local Governments, provide gadgets to students to support learning from home activities, such as in Nova Scotia, Canada (New Computers, Technology for Students) and Germany (*Corona-Hilfe I: Sofortausstattung*). The programs prioritize students who do not have learning devices at home. Other than learning devices, several countries provide subsidized internet data packages or free internet connectivity, such as Indonesia, Turkey, UK, US, and Saudi Arabia.

[9] In the context of education, technology, especially ICT, can be a resource for teachers to help students grasp a concept easily, make classes more interactive and interesting, and reduce the gap between theory and practice in the world of work later (Raja & Nagasubramani, 2018). However, digital technology also has drawbacks in the form of weakened focus, writing skills, and increased incidents of cheating (ibid.).

Training: France established a program "For the Future" that consists of training and equipment schemes, including training programs for teachers and parents, ensuring teaching resources and equipment are available, and conducting research that certain learning resources are robust.

Source: OECD, 2021b

2. Digital literacy for all

1. Physical IT infrastructures need to be developed to establish massive and equal digital transformation, especially throughout the G20 countries with lower internet penetration, such as Indonesia, Bulgaria, and Brazil (U.S. News et al., 2021). Governments need to equalize the distribution of IT infrastructure to allow different groups in the population to have equal and affordable access to the digital world. Entry points to the digital industry should also be widened through scholarship programs, job placement support, updated training, capacity building, or courses that are accessible for all, including marginalised communities and people in rural areas.
2. The COVID-19 pandemic accelerated the need to integrate digital literacy and skills development in the existing school curriculum by forcing education delivery through digital means throughout the world. Therefore, countries need to ensure that existing school curriculums also include the five main digital literacy competencies: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving (UNESCO, 2018). Countries must also accelerate technical and vocational education and training (TVET) to achieve the desired target of digital skills in their strategic economic sector, for instance in the agriculture and transportation sectors in Indonesia, finance and trade in China, or energy, science, and technology in the UK and the US.
3. The rapid increase in awareness-raising efforts on digital literacy and skills development to reach young people who are not in the formal education system is necessary, if not urgent. Examples include Weibo platform usage in China (Fu, 2020), Digital Storytelling practices on media literacy in Japan (Mizuhoshi, 2017), the use of TikTok and Instagram by Cybersmile Foundation in the UK to improve digital literacy and online safety, prevent cyberbullying, and reduce misinformation (www.cybersmile.org), and Siberkreasi program in Indonesia that partners with Spotify to improve the digital literacy of Indonesian youth through podcasts (Cabino, 2022). These practices demonstrate that digital literacy can be delivered in ways that are accessible to young people while increasing their readiness and competitiveness for the future of work.

4. UNESCO (2018) proposed a Global Framework for Digital Literacy[10] that has been tested in several countries, including Indonesia (See Box 2). The flexible methodology allows the user to identify the current level of skills and encourages a more even distribution of digital literacy and skills buildings for youth in different contexts. G20 members can use or expand the framework, for example by identifying the existing and ideal digital skills for young people working in the same sector but in different countries, thereby allowing future international mobility of the workforce. G20 members should also increase opportunities for studying abroad, job placement or attachment, training, or other exchange activities among G20 countries to provide the necessary exposure and future aspiration to the youth workforce.

Box 2: The state of digital literacy in Indonesia

In 2020, Indonesia conducted a survey on its digital literacy status using UNESCO's Global Framework of Reference on Digital Literacy Skills as a framework. The survey showed that 99% of respondents have mobile phones connected to the internet and 75% of respondents have internet access at home. Most use the internet to communicate, do social media activities, and watch videos online. In general, Indonesia's digital literacy level is at a moderate level (slightly above 3 out of a scale of 5), with the information and data literacy sub-index having the lowest score. A higher digital literacy index is correlated with younger age, males, higher education, and the ability to recognize hoaxes. More than 20% of respondents have posted sensitive personal information on social media, 30-60% have been exposed to hoaxes, and 11% have spread hoaxes. The survey showed that residents on the outskirts of urban areas in Java access the internet very intensively and are vulnerable to spreading hoaxes due to their lack of ability to verify data, especially data related to political, health, and religious issues. The study demonstrates the need to strengthen the public understanding of storing sensitive personal data on social media, increase critical thinking skills on media and data verification, and increase media capacity for quality data reporting and journalism.

Source: Indonesian Ministry of Communication and Information Technology, 2020

[10] GFDL is a pathway mapping methodology to guide countries in developing strategies and plans to advance digital literacy. GFDL recognises that specific digital literacy competency and proficiency level will depend on the specific country and its dominant economic sector, hence, encouraging its use as a framework of reference because its specific use differs according to the stakeholders and purposes, is important. Due to the flexibility of the methodology, countries can use the results to design specific curricula and assessments at the practical level of policymaking (UNESCO, 2018).

3. Inclusion and protection of marginalised groups

1. Despite the accelerated development of digital technology in G20 countries over the last 20 years, concerns remain on the inclusiveness of digital transformation[11]. In the context of gender disparities, a woman anywhere in the globe is less likely to be online and has little to no digital skills (Mishra, 2017). Therefore, it is critical to integrate digital training and education into current systems to better prepare marginalised groups, such as women, young people with disabilities, and the rural youth, in participating in the digital labour force. The integration also needs to consider the educational contents' personalisation to match the marginalised groups' needs.
2. Women are more likely than men to ignore the opportunities accessible in the digital world due to gender prejudice[12]. A substantial amount of experimental research has demonstrated that negative stereotypes influence women's and girls' math and science performance and ambitions through a phenomenon known as "stereotype threat" [13](Nguyen & Ryan, 2008). Hence, it is encouraged to teach girls to have a more flexible or growth mindset about intelligence. Schools need to facilitate an educational environment that exposes successful female role models in math and science to help counter negative stereotypes and overcome stereotype threats. Furthermore, governments, private sectors, NGOs, and other parties need to create more activities, such as capacity buildings, training, webinars, and workshops that can provide space for girls and young women to enhance their interests in pursuing STEM, especially in the digital-based field of work.
3. The private sector has provided most of the investment towards connectivity. This, however, is neither sustainable nor adequate. By 2040, Asia's digital infrastructure investment gap could reach $512 billion (Handforth and Tan, 2021). Therefore, more engagement and collaboration between the private and public sectors are required to assist marginalised groups and improve their connectivity and digital skills. Since marginalised groups require a wide range of digital skills, it is vital to identify and assess the uniqueness of their requirements. Once the needs have been determined, policies and programs must be assessed to see if they currently meet the needs. The assessment may also be used to set digital skill targets for marginalised groups and track their

[11] The diversity among G20 economies across various demographic groups appears to be driven mostly by income, level of education, age, region, and gender (OECD, 2017).

[12] Women in STEM (Science, Technology, Engineering, and Maths) make up just 28% of the workforce, while men significantly outnumber women in most STEM majors in college (AAUW, n.d.).

[13] Even female students who strongly identify with math—who think that they are good at math and being good in math is important to them—are vulnerable to its effects (Nguyen & Ryan, 2008).

development. For instance, the European Commission's Digital Skills and Jobs Coalition Initiative provides a model for the collaboration scheme. The program brings together Member States, businesses, social partners, non-profit organizations, and education providers to solve Europe's lack of digital skills.

4. Inclusion and protection of marginalised group could also be stretched to the state level in the context in which developing nations often found themselves at a structural disadvantage. Developing nations may find themselves marginalised in advanced digital industries like artificial intelligence or cybersecurity due to the "brain drain" phenomenon. This phenomenon may occur through three scenarios. First, when professionals in developing countries are employed by companies abroad in developed countries, leaving the already behind countries have an even harder time catching up (ILO, 2021). Second, when the private sector drained the experts in its country, leaving the public sector vulnerable (Maurer & Nelson, 2020). Third, when well-resourced industries like finance siphon even more professionals from the already limited pool, exacerbating the workforce challenge for nonfinancial yet critical sectors (Maurer & Nelson, 2020). To mitigate these "brains drain" scenarios, a few recommendations could be adopted. For instances, regulations that push foreign companies to not simply employ workers but also increase their capacity and requiring them to develop the industry in the respective country should be imposed. Furthermore, public sector could also provide other incentives besides salary (including but not limited to better working terms, capacity building, training, etc.) to remain competitive and attract professionals toward the critical sectors, and finally, the overall human resources and capacity in the country could also be leveraged.

4. Digital-based incubators

1. The success of digital-based incubators to facilitate youth entrepreneurs depends on the ecosystem in each country, which has a different policy, finance, human capital, culture, support, and market context (Isenberg, 2011). It is then important to improve the relevant laws and regulations for the development of the entrepreneurial ecosystem to be in line with not only each country's context but also the dynamics and interests of the youth. To achieve that, a multi-stakeholder approach that pays attention to start-ups and MSMEs in urban and rural areas should take place. The focus should be put on easy access to finance, training, and the global market, while also ensuring adherence to sustainable development goals (SDGs) to make sure these new enterprises are sustainable, eco-conscious, and effective.
2. Business incubators are meant to solve problems for entrepreneurs by acting as boot camps, coaching to develop their business ideas into commercially viable products for the market. As incubators are also proven to have lowered the failure rate of start-up companies, incubators for youth entrepreneurship could be more influential in the

economic revival, especially against the pandemic background. Adding to the fact that younger generations (millennials) have more propensity to be involved in entrepreneurship activities (e.g., corporate venturing activities) than elder generations (baby boomers) (Guerrero et al., 2019), digital business incubators have a high potential to become the state-of-the-art solutions for youth unemployment. Against that background, incentivizing incubators to collaborate in a global-scale mentorship program should be promoted. Governments should also participate as incubators or partner with existing ones and create a network of incubators with the member states to scale up these start-ups and MSMEs relatively quickly.

3. Incubators in the G20 countries vary in how they were designed and fit with the local entrepreneurship ecosystem. Developing a global digital incubator platform/program where digital incubators from all around the world can collaborate to exchange resources and knowledge will be beneficial to boost knowledge transfer and best practices to be quickly put into practice for youth entrepreneurs even in developing countries.
4. Existing digital incubator programs should also be enhanced, evaluated, and ensured to upskill and reskill the entrepreneurial youth through up-to-date practice-oriented learning and industry-specific methods aside from nurturing their innovations. Incubators, as training and education providers, should also be certified and assessed regularly to guarantee high-quality delivery.

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Appendix

LIST OF ACRONYMS

COVID-19	Corona Virus Disease 2019
G20	Group of Twenty
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
ICT	Information and Communications Technology
IoT	Internet of Things
MSMEs	Micro, Small, and Medium Enterprises
OECD	Organisation for Economic Cooperation and Development
PWDs	Person with Disabilities
STEM	Science, Technology, Engineering, and Maths
SDGs	Sustainable Development Goals
TVET	Technical and Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization