



SOUTHERN VOICE



POLICY BRIEF No. 18  
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# Skilling Uganda's youth for the fourth industrial revolution

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## Key messages



Ugandan youth risk being negatively affected by the fourth industrial revolution (4IR) if they lack the skills needed to participate in emerging labour market opportunities.



Bridging the skills gap through upskilling and reskilling programs are vital to increase youth employability in the 4IR.



To be part of the 4IR, young people need diverse expertise, including digital, socio-behavioural, analytical, and technical skills.

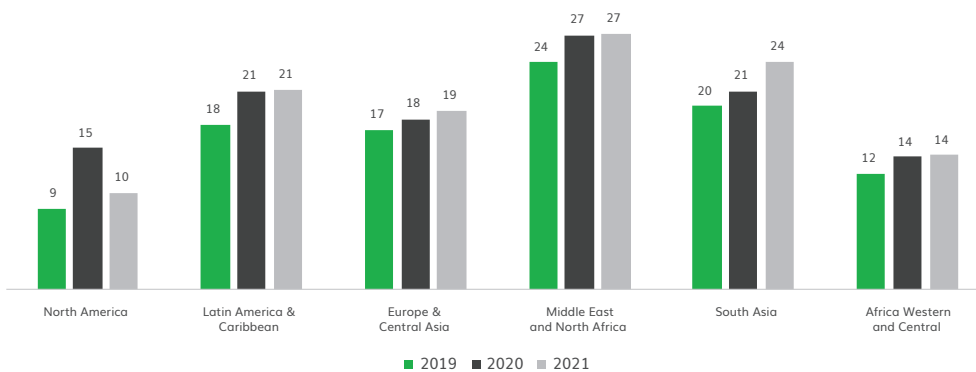


Prioritising youth competencies for Uganda's future economic growth requires targeted investing in foundational socio-behavioural education, analytical and technical training, and digital upskilling and reskilling programs.

## Introduction

The Global South is home to 90% of young people worldwide, and by 2030 young people will make up almost half of Africa's population (El Habti, 2022; GCA, 2021). This youth bulge is an opportunity for Global South countries to take advantage of a larger pool of potential workers to foster economic development. However, limited access to quality education, skills training, and economic opportunities limit the ability of Global South countries to harness this youth bulge (UNDESA, 2015; Gage, 2018). In fact, over 70 million youth globally are unemployed, with young people in the Global South twice as likely to be unemployed or underemployed as compared to the Global North (D'Allant, 2014). As shown in Figure 1, in 2021 youth unemployment stood at 10% in North America and Europe, while it reached 27% in the Middle East and North Africa, and 24% in South Asia. Youth unemployment for West and Central Africa in 2021 was relatively low at around 14%, but this low figure is mainly because 85% of youth in the region work in the informal sector. Thus they are outside the scope of unemployment figures (International Labour Organization [ILO], 2020; Guven & Karlen, 2020; Coulibaly, 2018). This includes those youth working in agriculture which employs almost half of Sub-Saharan Africa's labour force (Cieslik et al., 2022; Chen & Carré, 2020).

**Figure 1. Youth unemployment rates in different global regions for the period 2019-2021**



**Note.** Adapted from the World Bank development indicators by the World Bank (2022).

The challenge of addressing youth under-employment and unemployment, especially in developing countries, is likely to be exacerbated by the fourth industrial revolution (4IR). Emerging technologies such as the internet of things (IoT), robotics, virtual reality (VR), and artificial intelligence (AI) are expected to dominate the workplace and everyday life (The World Economic Forum, 2017). Automation is changing the nature and demands of the labour market, demanding highly skilled workers who are able to perform complex tasks, and adapt to new technologies (Ayentimi & Burgess, 2019; Elder & Siaka Koné, 2014). Also, robotics and AI are increasingly capable of

carrying out duties previously performed by people, meaning there is less demand for unskilled workers (Autor & Salomons, 2018). An estimated 40-50% of economic activities in African countries such as South Africa, Ethiopia, Kenya and Nigeria, are already susceptible to automation (World Economic Forum, 2017). Automation was also accelerated by the COVID-19 pandemic, which saw businesses prioritising and expanding their use of digital technology to interact with their workers and customers (Kimuli et al., 2021).

Generally, while the 4IR brings opportunities in terms of increased overall economic and labour productivity (Manda & Dhaou, 2019), it also threatens to increase youth unemployment in the Global South. This is because of the 4IR's automation of manual, low-skilled jobs, which in the informal sector—a key source of employment for youth in the Global South and especially in Sub-Saharan Africa (Zervoudi, 2020; Hawksworth et al., 2018). Failing to equip young people with the skills needed for the 4IR risks increasing income inequalities and poverty rates (Fox & Signe, 2022).

This policy brief focuses on the effects of the 4IR on youth in Sub-Saharan Africa, and in particular in Uganda where the informal sector accounts for 91.7% of youth employment. This is the eighth highest percentage in the world (Uganda Bureau of Statistics [UBOS], 2021a; ILO, 2021), and means that Ugandan youth are likely to feel the effects of the 4IR especially keenly. Failure to equip them with skills they need to meet changing labour market demands could render them effectively unemployable in the formal sector (Cieslik et al., 2022; Gollin et al., 2016). In this context, this brief explores the challenges Ugandan youth face in the wake of the 4IR. By analysing the literature and using secondary sources such as the Uganda National Household surveys (2016-2017/2019-2020), the brief explores the skills mismatch between youth's existing skills and those required by the 4IR labour market. In this respect, The World Development Report outlines key labour market skills demanded by the proliferation of advanced technologies in the 4IR (World Bank, 2019). The three key 4IR-skill categories identified and analysed here are:

1. Digital skills (application of technology and computer literacy);
2. Socio-behavioural skills (communication, leadership, collaboration, character, and behaviour);
3. Analytical and technical skills (critical thinking and problem-solving) (Khuraisah, 2020; Chaka, 2020).

The brief identifies possible ways of tackling the mismatch between the skills required by the 4IR and those youth currently possess. It must be noted, however, although it is important to address the skills mismatch so that young people can take advantage of opportunities the 4IR brings, another challenge is how to create jobs beyond the 4IR, accessible to young people with different skill sets. Although this is not

the focus of the brief, this consideration must be noted as the 4IR will not address all issues of youth unemployment, and other solutions will nevertheless be required.

## ■ The future of jobs and relevant skills for the 4IR

A key change in working life brought about by the 4IR is that technological developments are expected to give rise to a gig economy, where workers move between different jobs throughout their careers as opposed to having long-term employment with a single employer (World Economic Forum, 2021). Consequently, the 4IR-driven job market demands that workers engage in lifelong learning, constantly developing, refining, and upgrading their skills to meet ever-evolving workplace and market demands (World Bank, 2020). However, this presents particular challenges for Global South countries, including Uganda. Outdated education systems are ill-equipped to prepare graduates for a dynamic job market that requires diverse and constantly changing skill sets.

Figure 2 presents data on the supply and demand of the most important workforce skills for the 4IR for Sub-Saharan Africa (SSA) and the world. Data for SSA show deficits in all areas except communication and critical thinking. Most importantly, the data highlight significant supply gaps in digital skills, specifically in applied technology and computer literacy, with a demand-supply index gap of 1.2 and 1.3 points, respectively. Such a high demand-supply gap has serious consequences for workers, especially young people seeking to enter the labour force. Their lack of skills training makes them unable to meet the growing demands of the 4IR labour market. In turn, this will lead to higher unemployment, underemployment, and continued resort to a shrinking informal sector (UNICEF, n.d.).

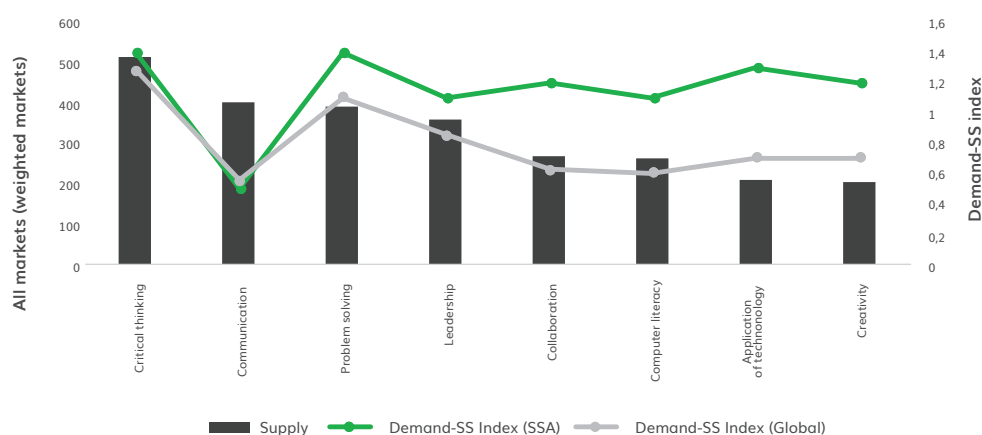
■ **The challenge of addressing youth under-employment and unemployment, especially in developing countries, is likely to be exacerbated by the influx of disruptive technologies associated with the 4IR.**

### Digital skills

The growing demand for digital skills is a critical aspect of youth employment in the 4IR. Digital skills are required to “use digital devices, communication applications, and networks to access and manage information” (UNESCO, 2018). As the 4IR unfolds, and businesses and governments are poised to develop new business models based on emerging technologies, they will require employees who possess the necessary digital skills to operate these technologies (Corydon et al., 2016). For instance, marketing campaigns are increasingly run through social media, with big data analytics now widely used to collect data instead of field data collectors. Similarly, digitisation is used widely in

the retail industry in the form of e-commerce, product placement, and shipping and handling (Ndung'u & Landry, 2020). The transportation sector has also witnessed a surge in the use of digital platforms. One such platform that has gained immense popularity in Uganda is the 'Safe boda-boda' service, which operates like Uber by connecting motorcycle taxis directly to their customers via an e-platform. Overall, businesses will increasingly rely on new technologies to make better use of capital, overcome information barriers, outsource their business, and increase innovation (World Bank, 2019).

■ **Figure 2. Demand and supply for most important workforce skills (World Development Report, 2019) comparing Sub-Saharan Africa and the globe<sup>1</sup>**



**Note.** Adapted from Digital Skills in Sub-Saharan Africa Spotlight on Ghana by International Finance Corporation (2019); the World Development Report by the World Bank (2019) and the World Bank development indicators by the World Bank (2022).

Evidence suggests that labour market demand for digital skills is already high in Uganda, Ghana and Kenya, with half the jobs in the region requiring these skills (International Finance Corporation [IFC], 2019). In this respect, the demand for digital skills in the region is expected to outpace other global markets due to several factors, such as Africa's higher youth population, rapid technological growth, emergence of tech hubs, political and economic support from the government, and global demand. This will create an abundance of job and economic opportunities for workers and employers in areas such as software development, data analytics, and digital marketing (IFC, 2019). However, due to lack of training and access to quality education to acquire the skills demanded by the 4IR, youth in Africa suffer from a "digital skills gap" (Bergong-Shilcock, 2020).

<sup>1</sup> Methodology for demand-supply index: A positive value on the index indicates that demand exceeds supply, and a negative value indicates the opposite. The magnitude of the value shows the extent of the demand-supply gap. For the gap index, the responses have been weighted according to the rank assigned to them with the following weights:  $D \gg S = 2$ ,  $D > S = 1$ ,  $D = S = 0$ ,  $D < S = -1$ ,  $D \ll S = -2$  and then normalised for each region to account for difference in the number of responses.

The government and private sector in Uganda have already made attempts to provide digital skills to young workers in the public and private sectors. Notably, Uganda's Ministry of Information Communications and Technology recently signed a 5-year agreement with International Computer Driving Licence, Africa, a private company which trains government workers in basic computer skills (Kiiza, 2023). Relatedly, the Federation of Small and Medium Enterprises of Uganda recently trained 300 SMEs across the country in various aspects of digital skilling, such as use of the internet and digital platforms such as WhatsApp and Facebook to increase business productivity and marketing (Abalabi, 2020). This training included young people from a wide range of occupations, including for example hairdressers, mechanical engineers, tailors, welders, and carpenters.

### **Socio-behavioural skills**

Socio-behavioural skills—also known as soft skills—are taught in early childhood and throughout adolescence, and are crucial attributes for successful engagement in the 4IR labour market (Napolitano et al., 2021; Williams, 2021). They are core competencies that enable effective communication, teamwork, problem-solving, and flexibility (Bennett et al., 2022). More specifically, soft skills are key to workers being able to interact and collaborate with co-workers, leaders, and internal and external stakeholders. Whereas many repetitive and manual tasks can be accomplished through automation, there are essential human skills—such as creativity, communication, emotional intelligence, and people management—that cannot be replaced by machines (Bühler et al., 2022).

In Uganda, a shift towards digitisation and technology integration in different sectors of the economy, including agriculture, finance, and health, has meant that employers are increasingly looking for workers with strong socio-behavioural skills (Guloba & Kakuru, 2021). For instance, according to a survey conducted by the World Bank in Uganda, 84% of employers identified socio-behavioural skills as key to success in the workplace, including communication, problem-solving, and critical thinking (World Bank, 2019). The Grameen Foundation, which uses mobile technology to provide financial services to small-scale farms, is an example of the relevance of socio-behavioural skills in Uganda. Workers with excellent communication skills who can explain difficult financial concepts to farmers and assist them in accessing financial services are crucial to the project's success (Grameen Foundation, n.d.). The Uganda Communications Commission (UCC) has trained over 400 Ugandan youth in a variety of socio-behavioural skills to better qualify them for employment and equip them to succeed in the rapidly evolving digital economy (UCC, 2022).

Technical skills, such as programming and application development, along with analytical skills, such as creative thinking and problem-solving, are also crucial for succeeding in the 4IR. It is projected that the 4IR will create a wide range of new jobs in fields such as science, technology, engineering, and mathematics (STEM), data analysis, computer science, and engineering—all fields which demand technical and analytical skills. For instance, it is estimated that by 2025, Uganda could create 300,000 additional green jobs in clean energy generation and energy efficiency related to 4IR technologies (ILO, 2022). Also, the number of software developers in Uganda tripled between 2010 and 2015, driven mainly by demand in the fastest-growing sectors of finance, health, and education (World Bank, 2016). In addition, Uganda's government and private sector have launched initiatives aimed at promoting education and training in technical and analytical skills. For example, the Uganda Business Process Outsourcing Association (UBPOA) has launched training programs aimed at equipping workers with skills in data analysis, software development, and technical skills. Similarly, the government has launched initiatives aimed at promoting STEM education in schools to equip students with the technical and analytical skills needed for the 4IR labour market (UBPOA, 2020). As this is a relatively new initiative, results of the programs are not yet available.

### ■ **Uganda's digital skills demand and youth skilling levels**

While there is no concrete information on the exact number of jobs the 4IR will create in Uganda alone, it is anticipated to provide over 16 million new job opportunities across Africa by 2030 in sectors such as data analysis, cybersecurity, and digital marketing (AfDB, 2019). These positions will require specific skills relating to digital tools and platforms. Moreover, digital change is taking place across sectors. For example, the Botswana Innovation Center and IBM co-created a cognitive computing platform that can assist in improving healthcare results (Botswana Innovation Hub, 2018). Employees need to possess competent digital skills to use this platform efficiently. Similarly, the African Development Bank (AfDB) has financed a healthcare digitisation project in Nigeria that necessitates the utilisation of digital skills by staff members (AfDB, 2019). The AfDB has also unveiled similar plans to invest in other African nations in the coming years, showing how relevant digital literacy is becoming in the region. However, policies and practices relating to digital skills among youth have yet to be effectively and widely

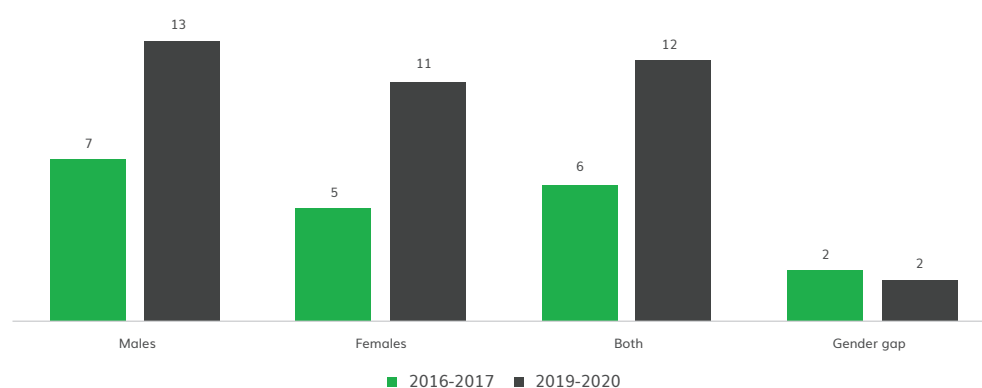
■ **Considering the growth in demand for digital skills, the government and private sector in Uganda have started engaging in efforts to provide digital skills to young workers in the public and private sectors.**



implemented.<sup>2</sup> Thus, young people in Uganda are at high risk of being excluded from the contemporary labour market.

Access to the internet provides young people with information on job opportunities in more locations, facilitates connections to potential employees and also enables employers to advertise jobs online (Suvankulov et al., 2012). As shown in Figure 3, access to the internet among youth has increased significantly from around 6% in 2016, to 12% in 2020. Notwithstanding this increase, the overwhelming majority (88%) of youth in Uganda still do not use the internet, and so are excluded from the digital economy due to a lack of digital skills (AfDB, 2019). Limited internet access is largely explained by high internet data costs, with Uganda having the highest internet data costs in East Africa (Kafeero, 2022), at USD 2.67 per Gigabyte, compared to USD 2.14 in Kenya, and 2.18 in Tanzania and Rwanda (UCC, 2022) and among the most expensive rates in the world (Kafeero, 2022). There is also a gender gap (see Figure 3), with internet use lower among young women than men. While there was a reduction in this gender gap over the same period from 2.2% to 1.8%, young women still engage less with the internet, and so have less access to the 4IR job market, compared to young men.

■ **Figure 3. Internet usage among youth in Uganda (2016 – 2020)**



**Note.** Own calculations based on the *Uganda National Household Survey* by the Uganda Bureau of Statistics, 2016-2017 and 2019-2020.

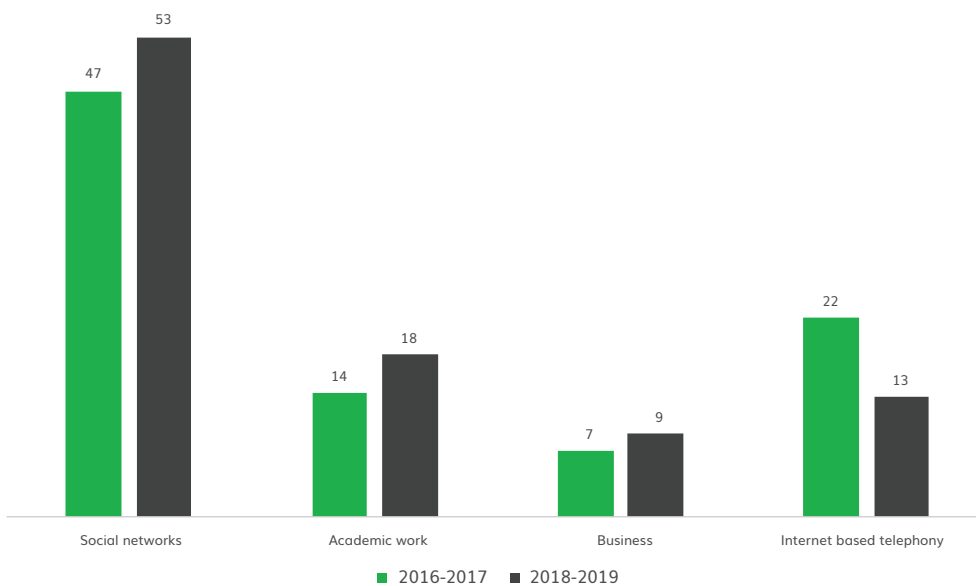
Further understanding of the level of digital skills among Ugandan youth can be gleaned from how they use the internet. Figure 4 shows that the majority of young people use the internet mainly for social networking. For instance, in 2016-2017, nearly 47% of young internet users reported using the internet mostly for WhatsApp, Twitter, and Facebook, increasing to nearly 53% in 2019-2020. The other main uses reported in 2019-2020 were academic work (18%), internet-based telephoning (13%), and

<sup>2</sup> It is worth noting that information on socio-behavioural and technical skills is not included in the Uganda National Household Survey (UNHS), and therefore is not included in this analysis.



business (9%). Over the same period, internet use has increased in all categories except internet telephoning, likely due to continuously growing mobile phone penetration in the country. As companies and employers increasingly use social media apps and networks to post job listings, young people's social media usage and navigational skills can be useful for seeking job opportunities, networking, and securing formal labour. However, social media skills ought to be complemented with other digital skills to make young people more competitive in the labour market. For example, skills enabling work-related tasks, engagement in data science and big data analytics, and programming.

■ **Figure 4. Different forms of internet usage among Ugandan youth (2016-2017 and 2019-2020)**

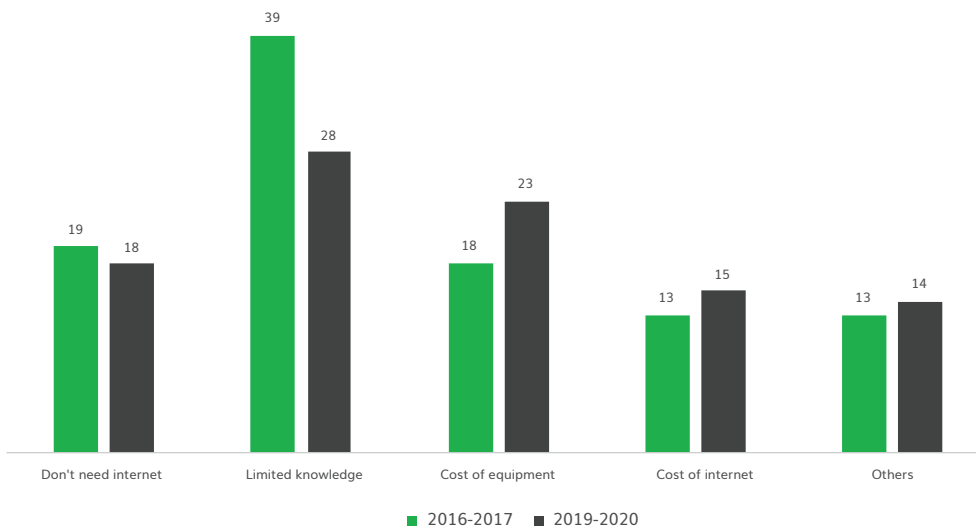


**Note.** Own calculations based on the *Uganda National Household Survey* by the Uganda Bureau of Statistics, 2016-2017 and 2019-2020.

One of the main barriers to digital skill development among youth in Uganda, as shown in Figure 5, is a lack of knowledge about how to use the internet. While the proportion reporting limited knowledge has declined from 39% in 2016-2017 to 28% in 2019-2020, over a quarter of youth in Uganda still do not know how to use the internet. This trend towards digitalisation is linked to the increased use of digital devices, including mobile phones, computers, and tablets. On the other hand, there are barriers which have become relatively more pronounced over the same period, including the high cost of equipment (increasing from 18% to 23%) and the cost of the internet (increasing from 13% to 15%). Moreover, nearly 20% of young people said that they did not need the internet, and although this figure reduced slightly to 18% by 2019-20, it suggests a significant number of young people do not see the internet as relevant to their lives. Overall, these barriers to developing digital skills

hamper young people's ability to develop the digital skills required to succeed in a more digitised labour market.

■ **Figure 5. Barriers to internet usage among Ugandan youth**



**Note.** Own calculations based on the *Uganda National Household Survey* by the Uganda Bureau of Statistics (2016-2017) and (2019-2020).

## ■ Policy environment for skilling for the 4IR in Uganda

Although the lack of internet access is an important barrier to young people engaging in the 4IR, it is also crucial for them to acquire the skills they need to leverage digital literacy for the 4IR fully. Uganda's National Employment Policy, last updated in 2011 (Ministry of Gender Labour and Social Development), identifies the main causes of youth unemployment as being a mismatch between the skills acquired in education and training and the requirements of employers, as well as limited job creation capacity within industries. Specifically, the policy emphasises that adequate primary and secondary education, followed by skills training, are key to increasing youth employment opportunities. The policy also recognises that technical and vocational education training (TVET) schools are critical in equipping young people with the skills they need to engage in the 4IR labour market (Paryono, 2017). However, the training they offer does not provide the robust cognitive and socio-behavioural skills the 4IR demands. 4IR technologies are yet to be introduced in TVET education in Uganda, largely due to limited infrastructure (lack of "smart" classrooms or internet connection, shortage of technological devices) and a lack of qualified trainers (ADEA, 2022). TVET schools also lack experts in areas such as critical thinking, communication and other key socio-behavioural skills. Delivery methods used in TVET schools are largely theoretical and academic, as opposed to flexible, work-oriented, and practical approaches (TVET policy, 2019). Although TVET policy recognises the need to advance digital skills in the

classroom, it is silent on essential 4IR digital capabilities, ranging from basic to advanced digital skills such as coding, application development, cloud technology, or computer programming.

Uganda's National Development Plan (NDP III) highlights the importance of developing skills, building infrastructure, and integrating the use of information communications and technology (ICT) in all sectors of the economy to enhance digital literacy. Indeed, the government has recently identified "ICT as a national development priority," stressing the large number of jobs that are increasingly using digital technologies (Bowman, 2019). The plan emphasises the need to increase digital literacy and hire professionals—such as machine learning and AI specialists, and data scientists—to train the population in these and other new technologies. Yet the government has not implemented these proposals, largely due to limited funding. Despite making up nearly 10% of Uganda's GDP, the ICT sector was allocated only 0.3% of the national budget in 2021, limiting the extent to which the plan can be implemented (Collaboration on International ICT Policy for East and Southern Africa [CIPESA], 2022).

Overall, the Ugandan government has explicitly recognised the crucial importance of digital skills and digital literacy. It has also developed policies to improve digital skills and provide opportunities for developing digital literacy amongst youth to enhance their access to national, regional, and global markets in the 4IR (Government of Uganda, 2020). However, the plan lacks a comprehensive assessment of skills requirements, and falls short in implementing policies to develop skill sets to match global labour market demand.

## ■ Conclusion

Using the case of Uganda, the brief has examined the skilling challenges faced by young people in the context of the 4IR in the Global South. While the 4IR presents opportunities to create more high-value jobs and simplify tasks, it can also result in higher unemployment and job losses among those lacking the skills and tools needed to succeed in the rapidly evolving job market. Addressing and solving youth unemployment and underemployment depends partly on the skills young people possess in relation to the 4IR job market. Reducing the mismatch between current skill levels among young people and the skills required by the 4IR is vital if they are to engage in the current labour market. In this way, re-skilling through developing digital skills, socio-behavioural skills, and analytical and technical skills for the 4IR labour market is critical.

However, policy in Uganda in this regard has been lacking. First, while Uganda has adopted policies and strategies aimed at addressing the skills required for young people to succeed in the 4IR, these are not implemented

on the ground, largely due to a lack of funding. Consequently, most young people in Uganda are excluded from the digital economy due to poor internet access, high cost of internet coverage, and insufficient digital skills, which lowers their chances of finding formal work. Moreover, TVET colleges—a key tool for facilitating young people’s entry into the job market—suffer from limited training in 4IR-related skills such as digital, analytical and technical, and socio-behavioural skills. This translates into persistently high rates of youth unemployment and underemployment, increased poverty levels, and heightened income inequality. High rates of youth unemployment and underemployment undermine efforts to achieve SDG 8 which underlines the need to achieve inclusive growth and decent employment for all.

## ■ Policy recommendations

In light of the above discussion, it is crucial that government and development partners engage in key interventions to enhance digital skills among young people. Firstly, giving priority to the productive development and implementation of upskilling and re-skilling programs in digital skills for youth, with active engagement of government officials and key stakeholders, would be beneficial in addressing the digital skills gap Ugandan youth currently suffer from. By placing emphasis on developing a wide range of digital skills, from social media usage to understanding and utilising different computer software and programmes, these upskilling and re-skilling programmes can prove useful in enhancing youth employability. Relatedly, it is important to provide upskilling initiatives targeting socio-behavioural and personal skills such as communication, networking, and team building, along with requisite skills such as digital and cognitive skills which are in high demand.

Secondly, Uganda can focus on strengthening its primary and secondary education and in TVET colleges. The aim here is to provide a strong grounding in cognitive and socio-behavioural skills. Specifically, investment in primary and secondary schooling that helps early learners to develop satisfactory cognitive skills, and basic technical STEM-related skills, which are all crucial for employment in the 4IR labour market. Moreover, TVET colleges need more financial support, updated technology, and more specialised staff to ensure that young people are able to take advantage of these educational opportunities and increase their employability.

■ **Barriers to developing digital skills such as limited knowledge, the high cost of internet access, and the high cost of equipment are a hindrance for youth developing the digital skills required to succeed in a more digitised labour market.**



Lastly, by increasing budget allocation to sectors involved in youth skilling, such as the ICT sector and the education sector, the Ugandan government can engage in effective investment and strategic planning. This will better prepare young people for the labour market, and enable them to take advantage of the wide range of opportunities that the 4IR brings.

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