## Assessment of skills supply and demand in the digital economy in Nigeria, including digital skills





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## **Acknowledgements**

This report is a culmination of the joint continental programme between the International Telecommunication Union (ITU) and the International Labour Organization (ILO), in support of the African Union, on Boosting Decent Jobs and Enhancing Skills for Youth in Africa's Digital Economy and is expected to pave the way for continued advancements in this area.

This report offers a comprehensive analysis of the skills supply and demand in Nigeria's digital economy, with a focus on identifying gaps, opportunities, and specific needs that, if addressed, have the potential to unlock new employment opportunities for Nigerian youth and improve their digital competencies. The findings of the report are expected to significantly contribute to the design and implementation of effective digital skills development initiatives in Nigeria.

The report was elaborated by ITU Expert, Mr Olumide Taiwo, PhD, Helpman Development Institute, and his team.

We would also like to recognize the support provided by the United Kingdom Foreign, Commonwealth and Development Office Digital Access Programme (UK-DAP) in Nigeria, through the ITU-UK-DAP partnership, in the broader scope of promoting effective regulation, greater investment, and innovative models for school connectivity in underserved communities and for broader digital inclusion. The findings of this report are expected to significantly contribute to the design and implementation of effective digital skills development initiatives.



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### Foreword



I am delighted to present this assessment which explores the state of the skills supply and demand in the digital economy in Nigeria, including digital skills.

In an effort to support innovation and encourage positive changes, ITU has been working with the United Kingdom Foreign, Commonwealth and Development Office (FCDO) Digital Access Programme in Nigeria, Kenya, South Africa, Brazil and Indonesia. The partnership is working towards understanding how universal connectivity could be achieved, in particular school connectivity. It is additionally looking at how to improve digital skills. Efforts have focused on supporting governments

with regulatory analysis, capacity development, tools and frameworks, and the exploration of innovative models relating to sustainable financing and technology developments. In conjunction with this work, ITU has also been working with ILO in support of the African Union on a Joint Programme on Boosting Decent Jobs and Enhancing Skills for Youth in Africa's Digital Economy.

This report explores some of the gaps and opportunities relating to digital skills in Nigeria, while also highlighting opportunities to create new employment for young people and to enhance their digital skills. The report goes further to make recommendations to support digital transformation for employers, address digital skills shortages and improve digital skills.

Designing and implementing effective digital skills development initiatives will not only enhance the digital skills and literacy of Nigerian youth and support employability, it will also support the growing digital economy, and competitiveness of Nigeria in the global digital stage.

Allong

Dr Cosmas Luckyson Zavazava Director, Telecommunication Development Bureau (BDT) International Telecommunication Union (ITU)

## **Executive summary**

#### Background

This report presents the findings of an assessment of current and emerging skill supply and demand in the digital economy in Nigeria with the view to identifying gaps, opportunities and detecting specific needs that, if addressed, can generate new employment opportunities for young people.

The assessment of Nigeria was developed under the ILO/ITU/AU Joint Programme on Boosting Decent Jobs and Enhancing Skills for Youth in Africa's Digital Economy that was launched under the aegis of the Global Initiative on Decent Jobs for Youth. The findings of the assessment will support the evidence base for the programme, which aims to support the creation of decent employment and enhance skills for youth in Africa's digital economy. The programme was initiated by the International Labour Organization (ILO) and the International Telecommunication Union (ITU), in support of the African Union (AU) and is focusing initially on six African countries (Côte d'Ivoire, Kenya, Nigeria, Rwanda, Senegal, and South Africa).

The methodology of the study involved desk review, survey of employers in selected sectors, survey of young people between 18 and 34 years old and consultations and in-depth interviews with key training providers including formal and informal vocational and technical education institutions, key government agencies, business associations, employee representatives and sector/industry experts. The study collected data and information to identify emerging skills and occupations as a result of digital transformation, and the aspirations, skills and skill gaps of the target youth population.

The study team leveraged several electronic platforms (WhatsApp, SMS and Email) and physical enumeration to administer the questionnaires. Targeted communications with specific organizations and individual workers and targeted use of social media were undertaken. The team also used email targeting, online forums, chat groups and mobile calls to obtain responses.

A total of 3 015 employers and 2 438 respondents between 18 and 34 years old answered the survey. In addition, three government agencies, ten training providers, one business association and two other stakeholders took part in the in-depth interviews.

#### Classification of digital skills

The study adapted a classification of digital skills at three levels: basic, intermediate, and advanced. The types of skills and their classifications are summarized in table below.

#### Types of skills and their classification

Level	Skills
Basic	Hardware skills (Using a keyboard / a smartphone; operating touch-screen tech- nology).
	<b>Software skills</b> (using Internet browsers; downloading apps and handling information; word processing (e.g., Microsoft word; excel and PowerPoint; managing files on laptops; managing privacy settings on mobile phones).
	<b>Online operations</b> (Email; search; or completing an online form; digital inter- action and communication (email; social media and basic transaction); safety; scan for viruses).
Intermediate	<b>Desktop publishing</b> (producing printed matter with the computer using a layout programme that integrates text and graphics).
	<b>Digital graphic design</b> (designing visuals; video and audio content using technology).
	Digital marketing (preparing online advertisement and marketing campaigns)
Advanced	<b>Coding and mobile app development</b> (creating; developing or adjusting an app or digital platform).
	Big data and analytics (analysing big data sets using technology).
	Artificial intelligence and virtual reality; Internet of Things and/or cybersecurity.

Source: The framework reflects the continuum of digital skills based on ITU, Digital Skills Toolkit (Page 7)

#### Findings

#### Characteristics of survey respondents

Business activities and by implication employment opportunities are concentrated in certain regions of Nigeria, owing to historical factors (including transnational trade and location of Nigeria's capital) and geographical factors (such as nearness to the sea). The South-West zone includes Lagos and Ogun and is home to the majority of Nigeria's industries, and the North-West zone includes Kano and Kaduna, well known for historical trading routes. These factors are incorporated into the sampling of employers across Nigeria. Thirty-seven per cent of sampled employers are from the South-West zone, followed by 16 per cent from North and the least represented being the South-South (9%). The prominence of wholesale and retail trade as the leading sector of activity in Nigeria also is also well reflected in the survey.

The economy is predominantly a micro-enterprise economy in Nigeria.<sup>1</sup> This is reflected in the survey in which 64 per cent of employers are micro-enterprises (employers with less than 10 workers). Micro-enterprises tend to exhibit weak capital base and weak capacity to invest in technologies, owing to economies of scale constraints.<sup>2</sup> Micro-enterprises and small businesses face challenges on both demand and supply sides of digital skills. On the demand side, evidence from complimentary studies show that only 1.8 per cent of micro-enterprises across all sectors

<sup>&</sup>lt;sup>1</sup> Micro enterprises account for 99.8 per cent of MSMEs in Nigeria (Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS), National Survey of Micro Small and Medium Enterprises (MSMEs) 2017).

Overall, about 68 per cent of micro enterprises start up with initial capital less of than N50,000 (in 2017 prices) and they dominantly operate as sole proprietorships with very little assets (Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS), National Survey of Micro Small and Medium Enterprises (MSMEs) 2017).

have an online business setup<sup>3</sup>, mostly due to lack of resources – expertise and finance – required to manage online platforms, thus limiting their capabilities to generate jobs requiring digital skills. On the supply side, most of the providers of digital skills training, including respondents to interviews conducted for this study, are micro-enterprises. Their challenges and key limitations to supplying more digital skills include unstable power supply, lack of access to finance, and scarcity of digital skills trainers. The combined effect of these factors leads to high costs of training, which is a major challenge for young people seeking to acquire digital skills.

Mobile phone access (via hotspots) is the leading source of Internet access cited by employers, and employer Internet usage is mainly related to activities that can be conducted via mobile phone. Owing to this factor, the speed and reliability of Internet is limited by the distribution of cellular base stations and strength of connectivity made available by the mobile network operators (MNOs) that mainly own fibre-optic links in Nigeria. From the survey, only 44 per cent of employers report having sufficient speed and reliability of Internet access.

About 94 per cent of the young people have some access to the Internet and nearly half (48%) have access all the time. Youth in urban areas where economic opportunities are more available and digital infrastructure is more developed have better access to Internet and data services than more remote areas. Across locations, rural and more remote areas are at disadvantage in terms of unlimited access to the Internet, perhaps due to financial constraints and technologies available in those areas. The proportion of young people having access to Internet and data all the time decreased progressively from 52 per cent in large cities and their suburbs to 48 per cent in small cities, 42 per cent in townships and informal settlements, and 37 per cent in rural areas. Five leading purposes account for 63 per cent of Internet usage (traffic) by the surveyed youth demographic: social media (15%), email exchanges (14%), Internet banking (12%), advertising (11%) data collection/research.

#### Demand for skills by employers, including digital skills

The economy in Nigeria is largely at the early stage of digital transformation, with 62 per cent of sampled employers either yet to invest in digital technologies or have only embraced basic digital technologies. This experience is the same for employers of all sizes except companies with 250 to 499 employees that are dominantly at the stage of automation of business processes. Investment in digital technologies have, on net basis, substantially raised demand for both skilled and unskilled workers. The employment effect is realized as demand for the use of technology in every facet of life raises both direct demand for workers with relevant digital skills and indirect demand for workers with other skills to carry out new tasks along the value chain.<sup>4</sup>

Being at the early stage of digital transformation, it is expected that most of the jobs requiring digital skills will require basic level skills. Accordingly, 62 per cent of current employees are reported to have only basic digital skills compared to 19 per cent for intermediate digital skills and 11 per cent for advanced digital skills. Employees with basic digital skills make up the majority of employees in all sectors and in all geopolitical zones. Intermediate level skills are employed mostly (as a share of all digital skills) in the ICT sector, the creative sector (arts, entertainment, and recreation) and the education sector while advanced skills are mostly employed in the ICT, manufacturing, finance and insurance, and public administration sectors. Geographically, intermediate level skills (as a share of all digital skills) are employed by organizations mostly in

<sup>&</sup>lt;sup>3</sup> Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS), National Survey of Micro Small and Medium Enterprises (MSMEs) 2017 page 51.

<sup>&</sup>lt;sup>4</sup> This viewpoint emerged from interview with Nigeria's Employers Consultative Association (NECA)

the South-East, South-South and North-Central while mostly advanced skills are employed in South-West, North-Central and South-East.

There are regional variations in the difficulty of finding digital skills, and shortage of digital skills at the different levels can be attributed to different factors.

Workers with basic digital skills account for the largest share of skills (35%) that employers are reportedly having difficulty finding<sup>5</sup> and the zones where employers are having most difficulty are North-East, North-West and South-West. Given that most employers are at the early stage of digital transformation, it is a rational expectation that most jobs will require only basic skills. On the supply side, youth digital literacy rates remain quite low as only a quarter of young people in Nigeria are digitally literate<sup>6</sup> based on data from statistical authorities, thus creating excess demand for basic skills. When disaggregated to zonal level, the statistics show that North-East, North-West and South-West zones have the three lowest rates of youth digital literacy,<sup>7</sup> consistent with findings from this survey. Notably, two of these three zones – North-West and North-East – are where foundational literacies are most difficult to find relative to other employability skills.

Advanced digital skills account for 11 per cent of current employment of digital skills but make up 30 per cent of digital skills that employers are reportedly having difficulties finding, indicative of an acute shortage. Ranked by the share of skills difficult to find, the leading sector having difficulties finding advanced digital skills are ICT (49%), education (39%), health and social services (38%), finance and insurance (35%), construction (33%) and the creative sector – arts, entertainment and recreation (32%). Zones where employers are mostly having difficulty finding advanced digital skills (as a share of digital skills difficult to find) are South-South (40%), North-East (36%), and South-West (33%). Advanced digital skills account for the majority of skills identified by training institutions, private sector associations, and government agencies, as those for which demand is spiking.<sup>8</sup>

Intermediate digital skills account for the lowest share (15%) of skills that are difficult to find, suggesting that finding workers with skills in this category is easy compared to basic and advanced levels of digital skills. This view is corroborated by responses to in-depth interviews with training providers who highlighted the fact that young people have largely been focused on acquiring intermediate level skills. Advice from training providers to young people has been that intermediate level skills are imperative for employment. As noted by a respondent, "... the basics is important, but ... doesn't get you the required skill sets to get employed". This view largely pervaded the guidance offered to young people, as noted by another respondent: "initially, we normally tell people to go to web design, go to digital Marketing, ...". This guidance led to a situation in which intermediate skills became relatively cheap for employers, as noted by other respondents: "Like they used to say the middle level is where you can find a whole

<sup>&</sup>lt;sup>5</sup> A respondent to in-depth survey is of the view that instead of looking for employment, the motive for acquiring basic skills may be "to start up their own SMEs and run their own café, or run their own small printing and laminating business of their own where they can do typesetting and printing". It could be that returns to basic skills are not encouraging in paid employment.

<sup>&</sup>lt;sup>6</sup> National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020)

<sup>&</sup>lt;sup>7</sup> See Figure 2.1, "Youth Computer literacy Rates by Zone" based on National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020)

<sup>&</sup>lt;sup>8</sup> Eight out of ten digital skills training institutions who responded to the question "What are current and emerging skills needs in the digital economy" identified skills at the advanced digital skills level as the foremost skill sets.

lot of people", and "most organizations recruit intermediate level people en-mass because the salaries are not that high, it is within the comfort zone of these organizations, so they can recruit people (at) intermediate level en-mass".

Although, intermediate level digital skills are relatively easy to find, the supply gap is more apparent in the South than the North.

When considering non-digital skills in Nigeria, employers are having most difficulty finding employees with foundational literacy skills, and this difficulty is experienced most in the Northern regions: North-West (22%), North-East (18%) and North-Central (17%). In addition, the lack of foundational literacies in the North is more challenging than the lack of communication skills, while in the South communication skills are harder to find than foundational literacies.

#### Aspirations and supply of skills among the youth labour force

In this survey, job seekers preferred the ICT sector most, followed by wholesale and retail trade, agriculture, forestry and fishing, education, health and social services, arts, entertainment and recreation, finance and insurance, and public administration. The preferential order of the aspirations differs from responses to similar questions asked in a youth survey conducted during the heat of the COVID-19 pandemic in 2020<sup>9</sup>, where agriculture/food was the leading sector of interest followed by wholesale and retail, health and social services, and manufacturing. Young men are twice as likely as young women to show interest in the ICT sector. Those with bachelor and postgraduate degrees are less interested in ICTs than people who do not have this level of education. Also, the ICT sector is most preferred by young people from South-West, South-East and North-East zones.

Basic digital skills were mentioned 52 per cent of the time, compared with 23 per cent for intermediate digital skills and 19 per cent for advanced digital skills in response to the question about digital skill that jobseekers need when looking for employment in their sectors of interest. Less educated job-seekers (below degree level) require basic digital skills more than holders of bachelor and postgraduate degrees. However, the perceived need for basic digital skills is most prevalent in North-West, North-Central and South-South, which are clearly not the zones where the ICT sector is the preferred sector. The perceived need for intermediate digital skills is most protector is most preferred. Also, the perceived need for advanced digital skills is most preferred in two out of these three zones. This suggests that young people interested in a career in ICTs understand that they will require intermediate and advanced digital skills in order to fulfil their dreams.

Lack of information about jobs or how to apply is the leading challenge for employment among the surveyed youth demographic, followed by work experience, digital skills and lack of education. The survey also shows that job-seekers face employment challenges due to their level of education, including lack of completed secondary education for those who did not complete any formal schooling, lack of tertiary education (diploma/degree) for holders of elementary and secondary school certificates and limited vacancies in areas of interest or qualification for postgraduate degree holders. However, holders of community college or intermediate certificates and bachelor degrees are mostly challenged by lack of information about jobs or how to apply.

<sup>&</sup>lt;sup>9</sup> Nationwide survey among young women and men (2020) 15-29 years old conducted by Nigeria Youth SDGs Network in collaboration with the UN Department of Economic and Social Affairs, the ILO and the Federal Ministry of Youth and Sports Development.

Possession of basic digital skills does not seem to predict or correlate with being employed. Rather, a higher percentage (71%) of the unemployed compared to 67 per cent of the employed possess basic digital skills. However, possession of intermediate and advanced digital skills seems to predict being employed, evident by the 11 per cent gap in possession of intermediate digital skills (48% versus 36%) and an 8 per cent gap in possession of advanced digital skills between employed and unemployed young people (28% versus 20%). These numbers are consistent with the narrative from in-depth interviews indicating that having basic digital skill does not translate into employment, and that intermediate skills are necessary to secure employment. Ninety per cent of 18 to 34-year-olds surveyed either agree or strongly agree with the view that improved digital skills will enhance their chances of getting a job.

Young job-seeker understanding of workplace-related digital skills (evaluated in terms of distribution across the tiers of digital skills) is similar to the understanding that young workers need to do their jobs. It thus appears that there is free flow of information about job requirements between the employed and unemployed, perhaps powered by social media, social networks and counselling from digital skill training institutions. This is buttressed by the finding that 92 per cent of employers consider the preparedness of young people for the labour market to be sufficient, good or very good. However, young people who are out of work cite lack of information about where they can find the jobs and how to apply for them, as well as work experience and lack of digital skills as the leading factors keeping them unemployed. It appears that job search, work experience, and digital skills challenges are pressing issues in addressing youth unemployment.

The lack of access to information on the labour market stands out as one of the principal limitations for the acquisition of digital and employability skills among both employed and unemployed youth. When survey respondents in the group of 18 to 34-year-old were asked "What do you need so you can develop digital or other employability skills?", the combination of responses that referred to "information about which skills are important" and "information about where I can acquire the skills" totalled 26 per cent among the employed and 24 per cent among the employed, ahead of affordability (money/financial support) at 16 per cent among the employed and 17 per cent among unemployed.

#### Skill gap analysis

Employers are overwhelmingly of the view (92%) that young people are well prepared for the labour market. Self-assessment of the match between skills acquired and skills required in the labour market shows some level of mismatch, with employed youth reporting an average of 70 per cent and the job-seekers reporting an average of 60 per cent.<sup>10</sup>

<sup>&</sup>lt;sup>10</sup> The question asked is: "In general, would you say your digital skills are well matched to the needs of your current job? Please give your rating on a scale of 1 to 10, where 1 means you have none of the skills required, and 10 means you have all the skills required.

Microworkers on online platforms (typically not carried out in-person by employees of organizations but by short-term freelancers to perform specific tasks<sup>11</sup>) account for the leading share of roles requiring digital skills currently employed by employers (28%). In particular, they make up the highest proportion of digital roles currently employed, digital roles difficult to find in the market, and digital roles that will be needed in the next five years in both North-East and North-West zones. Microworker platforms could represent one of the means of improving availability of digital skills across Nigeria in the face of challenges to free movement of labour due to security. Given the likelihood that most employers expect to use these platforms in the future, it is important that young people are made aware of and understand how these platforms work. Presently, 51 per cent of young people do not know how microtask platforms work (never heard about it or heard about it but don't know how they work).

Website management (12%) and website design (10%) are leading roles requiring digital skills. Website management is most difficult to find in North-East and South-East; while web design is most difficult to find in South-East and North-West. Similarly, in the next five years, the anticipated need for website management skills is highest in North-East and South-South while the anticipated need for website design is highest in the South-South, South-East and North-East.

Five important roles (desktop/support technicians, data analysts, ICT engineers, software developers, and data scientists) account for 25 per cent of roles currently employed, 27 per cent of roles currently difficult to find, and 29 per cent of roles that will be needed in the next five years, implying the increasing importance of these roles among employers in Nigeria.

#### Digital skills training institutions, platforms and opportunities

Outsourcing of formal staff training programmes to accredited training providers is the most common means by which employers provide employees with learning and development opportunities. These opportunities are usually for intermediate and advanced digital skills.<sup>12</sup> However, most institutions that offer intermediate and advanced digital training courses also have basic/beginner courses to provide a foundation for those who lack any digital skills. There are also interventions aimed at ensuring digital literacy of citizens at various levels (primary and secondary school and at community level). The list of these interventions is provided in Annex 2.

Government interventions and programmes in digital skills acquisition in the form of grants, capacity-building, and other forms of technical support were mainly targeted at the industrial areas of Nigeria (South-West and North-West zones) and benefitted larger more than smaller employers, with micro and small employers least likely to benefit. Low capital base of micro and small businesses in relation to the cost of digital technologies will prevent them from investing

<sup>&</sup>lt;sup>11</sup> A review of the two common microworker platforms often cited by young people shows that they are open to individuals with intermediate and advanced digital skills. In Fiverr, the typical options are Graphics and Design, Digital Marketing, Writing and Translation, Video and Animation, Programming and Tech, and Data. In Upwork, the categories available include Accounting and Consulting; Admin Support; Customer Service; Data Science and Analysis; Design and Creative; Engineering and Architecture; IT and Networking; Web, Mobile, and Software Development. The roles classified under these categories are available to all levels of digital skills. Thus, the levels of skills being sought from microworkers on online platforms vary from basic to advanced, thus the prominence of microworker on online platforms is more likely a strategy for filling various levels of digital roles rather than searching for a specific level of digital skill. It also appears that the platforms can source digital skills for freelance, short-term and medium-term engagements.

<sup>&</sup>lt;sup>12</sup> Most institutions that offer intermediate and advanced digital training courses also have the basic/beginner course as a foundation for those who lack any digital skill and wish to advance their skills. However, there are interventions aimed at ensuring digital literacy of citizens at various levels (primary and secondary school and at community level). The list of these interventions is provided in the Annex.

in necessary technologies and providing employee development opportunities, thus making digital transformation less likely for smaller employers.

#### Recommendations

The recommendations based on the study findings are organized into four areas: support to employers for digital transformation (demand side), support for digital and employability skills supply (*supply side*), matching skills to jobs, and promotion and regulation of digital platforms.

Support to employers for digital transformation: Government and development partner support for employers on digital transformation could deepen the digital economy and expand employment for young people if the measures are targeted to address the finance and expertise challenges faced by micro-enterprises and small businesses. The targeted measures include easing access to finance to enable employers invest in digital and other technologies, technical support for employers on online business setup, and support for employee digital skilling opportunities. Some of these measures are in currently in place (see section 8) but are biased towards larger employers, necessitating complementary interventions towards smaller employers.

Support for digital and employability skills supply: Interventions to meet current excess demand for basic digital skills should be targeted toward the North-East, North-West and South-West zones where digital literacy levels are lowest in Nigeria. Support for basic skills should be targeted toward those with elementary education, secondary school certificates, and holders of community college/intermediate certificates (up to a bachelor degree). To meet emerging needs for basic digital skills in the future, interventions should be targeted at revising the basic education curriculum to integrate basic digital skills into the mandatory nine years of schooling from primary through junior secondary schools. This will ensure that everyone who attains basic education level (JSS3) would have acquired basic digital literacy (have the basic digital skills.<sup>13</sup>

Interventions to boost supply of intermediate skills should be prioritized in the Southern zones (South-East, South-South and South-West) where supply is more limited relative to demand. However, website management and web design could also be prioritized in North-East and North-West. These interventions could be delivered in partnership/collaboration with digital skills training institutions and development partners to subsidize training.

Interventions to boost supply of advanced digital skills are needed most in the South-South, South-West and North-East. The priority areas include desktop/support technicians, data analysts, ICT engineers, software developers and data scientists. These interventions could be delivered in partnership/collaboration with digital skills training institutions and development partners to subsidize training.

In the area of non-digital employability skills, interventions to boost foundational literacy should be prioritized in the North while interventions to boost communications skills should be prioritized in the South of the country.

*Support for skills-to-jobs matching:* Investment in labour market information system for skills-to-jobs matching is required at two levels. First, a publicly funded labour market information system (LMIS) is required that will capture job vacancies from industry, the location of the vacancies and

<sup>&</sup>lt;sup>13</sup> According to the existing 9-3-4 education system, every child is expected to complete nine years of basic education by age 15, and this is the entry point into the working-age population and the labour force.

the skills required by the market, and the education and training institutions including technical and vocational education and training offering the skills. The LMIS should be accessible at no cost to job-seekers, social planners, parents who are making decisions of skill acquisition for their children, and education and training institutions who need to know which skill needs are emerging in order to channel their programmes accordingly.<sup>14</sup> Second, career counselling and job placement centres should be revived in universities, mono/polytechnics and community colleges/intermediate level institutions. These centres should be networked with the public LMIS to enable students in educational and training institutions acquire the information they need to navigate the labour market.

There have been efforts to develop an LMIS but no existing platform is suitable to serve this purpose. The National Electronic Labour Exchange (NELEX) hosted at the Federal Ministry of Labor and Employment (MLE) is inactive and unknown. Several initiatives of MLE to match jobseekers and employers at the state level as well as initiatives of the National Youth Service Corp (NYSC) and N-Power Program for similar purpose are severely limited in their scope and visibility. The national Universities Commission (NUC) conducted a partial LMIS in 2012 that focused on vacancies in manufacturing sector.<sup>15</sup> There has been no repeat study since then. Private sector investment in skill-job matching exists, and the Jobberman portal is the most widely known. However, the database is available only on a for-profit basis.

To address the lack of work experience, the existing Students' Industrial Work Experience Scheme (SIWES), which currently applies to a segment of undergraduate programmes, could be extended to all undergraduate programmes in all universities, mono/polytechnics, and post-secondary colleges.

*Promotion and regulation:* Government should look into the operations of digital labour platforms in Nigeria, in particular microwork platforms in respect of digital skills, to understand how they work and examine how to promote the platforms among young people and introduce regulation of the platforms to protect workers. This strategy could, in general, support increased supply to meet shortage of digital skills and, in particular, help improve supply of digital skills in the North-East and North-West, zones that are currently affected by security challenges.

#### Collaboration to address digital skills shortage

The implementation of the recommendations to address the digital skills shortage can leverage existing or potential types of collaboration.

*Collaboration between employers and digital skills training institutions*: In this collaboration, employers outsource recruitment for roles requiring digital skills to the training institutions who either shortlist from their list of current or past trainees, or advertise, interview and shortlist candidates for the roles on behalf of the employer. An example is the collaboration between New Horizon Nigeria, a digital skills training institution and Julius Berger, Transmission Corporation of Nigeria (TCN) and Cool FM Radio.

<sup>&</sup>lt;sup>14</sup> A provider of digital skills remarked "If there is a way the private sectors can specify the skills they need their employees to have, we can channel our energy and resources into training more people to have the required skills".

<sup>&</sup>lt;sup>15</sup> The report is available at <u>http://nuc.edu.ng/wp-content/uploads/2016/02/LMOP-Report-Manufacturing</u> <u>-Sector-2012.pdf</u>

Collaboration between development partners and digital skills training institutions: This collaboration fulfils development partner programme objectives. An example is the collaboration between German Agency for International Cooperation (GIZ) and Afrihub Institute to train graduates in programming, web development, cybersecurity, data science and computer networking. Beneficiaries are recruited through a process that is open to all unemployed youth in Nigeria.

Collaboration between government, development partners big tech firms and training institutions to further digital innovation and entrepreneurship: Small and large technology firms such as IBM, Huawei, Microsoft and development partners including the World Bank, the African Development Bank, USAID, ILO, and ITU are ideal and open to such collaboration. While advanced digital skills are in acute shortage in the market, the skill sets at this level are not readily affordable for young people, and the shortage will likely persist into the future. This collaboration will heavily subsidize the supply of those skills and guarantee mass production for the growth of the digital economy and expansion of employment for young people.

Intragovernmental collaboration between government agencies: Collaboration between the Ministry of Communications and Digital Economy (MCoDE) and the ICT departments of all ministries and Agencies is necessary to address the digital skills gap within the public sector, perhaps with involvement of the Office of Head of Service to enable MCoDE train, develop, and supply digitally skilled personnel to ICT units of all government ministries, departments and agencies.<sup>16</sup> Another example of intra-governmental collaboration is the case of MCoDE collaboration with state governments to conduct digital job training in 12 states as part of the implementation of the National Digital Economy Policy and Strategy. This type of collaboration between MCoDE and Small and Medium Enterprise Development Agency of Nigeria (SMEDAN) will support the digital transformation of micro-enterprises and small business.

Collaboration between industry, professional associations, institutions of higher education/ training and government agencies: This collaboration is useful to reflect industry digital skill needs in periodic curriculum reviews in higher educational and training institutions. The National Universities Commission (NUC) and relevant governing institutions for polytechnics and colleges of education are the frontline agencies to represent the Ministry of Education in this process. However, many higher institutions pay lip service to this requirement, with the consequence that instructional curriculums lag behind industry and practice requirements. Specifically, the digital skills required in industry should be introduced into the courses and updated periodically. This approach will enable graduates of any discipline to acquire key intermediate digital skills and develop competences in digital tools relevant to their disciplines prior to graduation.<sup>17</sup> This collaboration is also necessary for development of a labour market information system (LMIS).

<sup>&</sup>lt;sup>16</sup> This practice currently exists between the Ministry of Budget and Economic Planning (MBEP) and all other Ministries, where staff of the Department of Budget in all ministries are from MBEP.

<sup>&</sup>lt;sup>17</sup> This will help to address skills deficiency challenges such as the frustration expressed by two digital skill trainers: "What you have now are lecturers using old notes and doing handouts and manuals. I have IT students taking my class and most of them are talking about Fortran 77. And this is a programming language that was done 1977. And we are now talking about Python. Today we are talking about Java scripts. And teaching them Java and they don't have access to the system to learn the Java. They are writing codes on papers. So, these are the things we face, we have to go back to the scratch and start lecturing them. It is that bad...". "The problem with university education, (we have spoken about this in the past few days) is that although it is very specific to research and communicated in an academic way; the truth is, the real world is not academic. Digital skills have really disrupted current skillsets. I think many graduates that come out of school are not even aware of the skills that they're required to have. ...if it was added more into the curriculum, we will not be having these problems."

## 1 Background

#### 1.1 Introduction

Africa's growing youth population and digital transition represent a huge opportunity to bolster African economies while addressing the persistent high levels of unemployment and underemployment as well as working poverty among young people. The Sustainable Development Goal (SDG) Target 4.4 requires countries to substantially increase the number of young people and adults who have relevant skills, including technical and vocational skills for employment, decent jobs and entrepreneurship by 2030. Tracking progress in digital skills, indicator 4.4.1 measures the size of youth and adult populations who have the information technology skills to give them a path to better jobs.

Efforts to improve digital literacy in Nigeria have yielded only meagre results: digital literacy rates among the 15 to 35 year-olds improved only marginally from 21 per cent in 2012 to 25 per cent in 2020, at an average of 0.5 per cent increase per year.<sup>1</sup> To accelerate development of the digital economy, the Ministry of Communications was re-designated as the Ministry of Communications and Digital Economy in October 2019 to pursue a more holistic development of the digital economy. In its first National Digital Economy Policy and Strategy 2020-2030, the ministry plans to support the digital literacy of citizens, businesses and government workers and enable them to acquire cutting-edge digital skills and achieve 95 per cent digital literacy by 2030.<sup>2</sup>

Young women and men are faced with considerable challenges in finding decent work opportunities. Next to the availability of jobs for young people, work quality presents a formidable challenge in the labour market in Nigeria as the overwhelming majority of people work in the informal economy. Linked to this trend, some 38 per cent of employed persons across the Africa region were living in poverty in 2018, with the rate for 15- to 24-year-olds being double that of adult workers.<sup>3</sup> A further key constraint in the youth labour market is the misalignment between labour supply (skills) and demand (jobs). The education system, particularly at the technical and vocational education and training level, faces several challenges including limited access, quality and infrastructure, while young people continue to have few opportunities to learn on the job, for instance through apprenticeships or internships. Improving the labour market relevance of education outcomes requires better alignment between skills supply and demand.

To this end, information and communication technologies (ICTs) can enhance education, reduce youth unemployment and promote social and economic development. However, for young people to benefit from the transformative power of ICTs, they must be equipped with a range of digital skills and have affordable access to connectivity. The economy in Nigeria demonstrates significant potential to harness technological change and ICTs in order to create

<sup>&</sup>lt;sup>1</sup> National Bureau of Statistics and Federal Ministry of Youth Development, 2012 National Baseline Youth Survey; National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Youth Survey 2020.

<sup>&</sup>lt;sup>2</sup> Federal Ministry of Communications and Digital Economy, The Digital Economy Policy and Strategy (2020 to 2030), page 21, Objectives of the Digital Economy Policy and Strategy (Items vi and vii).

<sup>&</sup>lt;sup>3</sup> United Nations Department of Economics and Social Affairs, Statistics Division, SDG Indicators. See <u>https://unstats.un.org/sdgs/report/2019/goal-01/.</u>

a large number of jobs for its young people: for example, Nigeria is Africa's largest business to consumer (B2C) e-commerce market in terms of both numbers of shoppers and turnover.<sup>4</sup> Still, lack of digital infrastructure and devices, sustainable power supply, institutional frameworks, educational practices and digital literacy and skills present important barriers that need to be urgently addressed.

To create decent employment and enhance skills for young people in Africa's digital economy, the International Labour Organization (ILO) and the International Telecommunication Union (ITU), with the support of the African Union (AU), have initiated a programme with continental reach. The ILO/ITU/AU Joint Programme on Boosting Decent Jobs and Enhancing Skills for Youth in Africa's Digital Economy has been launched under the aegis of the Global Initiative on Decent Jobs for Youth and focuses initially on six African countries (Côte d'Ivoire, Kenya, Nigeria, Rwanda, Senegal, and South Africa).

The programme framework at continental and national level was developed in consultation with young people, governments, worker and employer organizations, educators and public and private actors of the digital economy. The programme will operate through an iterative cycle of implementing interventions to create jobs, strengthen digital skills and improve employment services; establishing partnerships and networks; and providing policy advice using new diagnostic tools and data showing what best boosts youth employment. Informed by digital economy priorities and plans at the national level, the programme will facilitate exchange of information and learning across the six target countries and beyond. The programme implementation in Nigeria in 2021 includes activities to lay the groundwork for scaling-up interventions, developing and deploying analytical tools to generate evidence on youth employment opportunities in the digital economy.

#### 1.2 Objective and relevance

The objective of this study is to assess current and emerging skills supply and demand in the digital economy in Nigeria with the view to identify gaps, opportunities and detect specific needs that, if addressed, can generate new employment opportunities for young people.

The results of the assessment will facilitate co-designing digital skills development initiatives with ILO and ITU constituents in Nigeria as part of the ILO/ITU/AU Joint Programme on Boosting Decent Jobs and Enhancing Skills for Youth in Africa's Digital Economy in Nigeria, among them:

- strengthening and upgrading digital literacy and skills curricula and competency standards;
- integrating digital literacy and skills trainings into existing educational programmes at federal, state and local levels;
- capacitating training institutions to deliver training programmes with digital skills components; and,
- establishing platforms/forums to integrate the trained job seekers with opportunities in the digital economy (linking demand with supply).

<sup>&</sup>lt;sup>4</sup> UNCTAD B2C E-Commerce Index 2018 Focus on Africa, UNCTAD Technical Notes on ICT for Development No. 12. Page 14.

#### **1.3** Key research topics

In pursuit of the objective, the key research areas of the assessment include the following:

- Digital economy potential and diagnosis covering 1) assessment of existing policies and strategies related to the digital economy and recommendations to unlock employment opportunities for young women and men; 2) rapid market analysis of digital and e-commerce platforms (desk review) with a view of informing the choice of geographic areas and economic sectors to further focus the digital skills assessment on, and 3) current and potential job growth opportunities from a public and private sector development perspective including an identification of priority sectors.
- Skills demand side covering 1) current and emerging skills required by the private and public sector to unlock job creation opportunities in the digital economy; 2) skills (by type of digital skills, and related skills) and labour shortages (by type of occupation) in the targeted sectors where demand has spiked due to digitalization and/or that are prioritized under national development plans; 3) critical digital skills applicable to the analysed sectors (split into basic, intermediate and advanced digital skills); and 4) other employability skills that can be relevant to the targeted sectors (foundation skills, core skills, soft skills, business management and entrepreneurship skills, transferable technical skills).
- Skills supply side covering 1) understanding of the youth target audience, in terms of needs, potential and vulnerabilities; 2) sets of skills currently available and resulting from on-going training courses and programmes; and 3) training programmes (existing or missing) that are of significant importance to the digital economy (by mirroring skill demand and supply analysis).

#### 1.4 Digital transformation and development

The World Economic Forum and the Group of Twenty (G20) defined the digital economy "as a broad range of economic activities comprising all jobs in the digital sector as well as digital occupations in non-digital sectors".<sup>5</sup> The European Commission includes digital platforms that enable surplus capacity connected with demand by connecting firms offering products and services through the Internet to those in need of them as part of digital economy.<sup>6</sup> The Nigerian National Digital Economy Policy and Strategy (NDEPS, 2020) refers to digital economy as being any aspect of the economy that utilizes or is influenced by digital technologies.<sup>7</sup> The digital economy is also considered as a component of economic output derived exclusively from digital technology with business models based on digital goods and services.<sup>8</sup>

The global economy is being reshaped and redefined by rapid digital transformation, infiltrating practically every industry and element of daily life, and altering the norms around studying, working and trading. Nigeria is thought to be in a unique position to benefit from this fast-growing digital economy<sup>9</sup> due to the possibilities for quick economic growth, innovation, job creation, and consistent service provision which are all enhanced by the wave of digital change.<sup>10</sup>

<sup>&</sup>lt;sup>5</sup> Federal Ministry of Communications and Digital Economy, The Digital Economy Policy and Strategy (2020 to 2030), page 15.

<sup>&</sup>lt;sup>6</sup> EurWork, Digital Economy 2018 (<u>https://www.eurofound.europa.eu/observatories/eurwork/industrial</u> <u>-relations-dictionary/digital-economy</u>)

<sup>&</sup>lt;sup>7</sup> Federal Ministry of Communications and Digital Economy, The Digital Economy Policy and Strategy (2020 to 2030), page 15.

<sup>&</sup>lt;sup>8</sup> Rumana Bukht and Richard Heeks, Defining, Conceptualising and Measuring the Digital Economy, 2017 page 1; World Bank Group Nigeria Digital Economy Diagnostic Report 2019, page 8; Malik Adeyemo, Digital Business and Tax Revenue Generation in Nigeria 2020 page 622.

<sup>&</sup>lt;sup>9</sup> Jobberman, Digital sector skills gap report, 2020 page 17.

<sup>&</sup>lt;sup>10</sup> World Bank Group, Africa pulse Charting a Road to Recovery, Volume 22 2020 page 69.

Following the series of activities spurred by the development, Nigeria has shown a high level of readiness for digital transformation and there has been an explosion of digital activities. This transformation has been largely driven by the private sector with the government recently chipping in by introducing initiatives that will promote the transformation. The development of the National Information Communication Technology Policy (2012), the Digital Economy Policy and Strategy (2020-2030), and the Nigerian National Broadband Plan (2020-2025) demonstrate the quest by the Government of Nigeria to transform the digital landscape going forward. Through the Central Bank of Nigeria (CBN), the government has put in place measures to encourage digital transformation and, ultimately, financial inclusion in Nigeria.<sup>11</sup>

The digital economy is deemed to consist of various components, including a platform economy (also called the gig economy), Industry 4.0 (known as the fourth industrial revolution), robotics and Artificial Intelligence (AI), machine learning and e-commerce among others.<sup>12</sup> The gig economy online platforms facilitate "digital interactions" among people, and make use of the Internet to connect various networks of people in order to facilitate digital interactions.<sup>13</sup> Robotics, AI and machine learning are now being used in finance, transportation, aviation and communications where critical thinking and judgment is being incorporated into response.<sup>14</sup> E-commerce captures the trading aspect of the digital economy, the marketplace that facilitates online transactions. The fourth industrial revolution<sup>15</sup> encapsulates more advanced digital production technologies including hardware (for example, industrial robots and cobots, as well as 3D printers), software platforms (for example, big data analytics, artificial intelligence, and cloud computing), and connectivity (the Internet of Things). These technologies enable job opportunities in data gathering, data analysis, cloud architecture, machine learning, programming, and machine automation, among other fields. The development and use of advanced digital technology for production has significant consequences for productivity growth and job creation especially in the manufacturing sector.

The global digital economy was estimated at about USD 11.5 trillion in 2016, equivalent to 15.5 per cent of global GDP and is expected to reach 25 per cent of GDP in less than a decade thereafter, quickly outpacing the growth of the overall economy.<sup>16</sup> Given its large, young, and entrepreneurial population, digital entrepreneurship has the potential to become an engine of economic transformation and set Nigeria on a new growth trajectory.

According to data from the Central Bank of Nigeria (CBN), ICT sector contributions to GDP increased from 9.4 per cent in 2015 to 14.2 per cent in 2020, which exceeded the contribution to GDP from the oil sector (8.8%) in the same quarter.

<sup>&</sup>lt;sup>11</sup> Africa Connected Digital transformation and financial inclusion in Nigeria, Issue 6 2021 page 19.

<sup>&</sup>lt;sup>12</sup> World Bank Group Nigeria Digital Economy Diagnostic Report 2019, page 8; Malik Adeyemo, Digital Business and Tax Revenue Generation in Nigeria 2020 page 622.

 $<sup>^{13}</sup>$  Deliotte, The rise of the platform economy, 2019 page 2.

<sup>&</sup>lt;sup>14</sup> Darrell M. West, What happens if robots take the jobs? The impact of emerging technologies on employment and public policy, 2015 page 4.

<sup>&</sup>lt;sup>15</sup> See Deutsche Bank, Digital Economy and structural change 2018 page 3 and (<u>https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/</u>)

<sup>&</sup>lt;sup>16</sup> World Bank Group Nigeria Digital Economy Diagnostic Report 2019, page 18.



Figure 1.1: ICT contribution to real GDP (Q2 2015 - Q2 2020)



Nigeria has the potential to be Africa's largest digital market and top investment region, with venture capital investments reaching an all-time high of over USD 660 million in 2019.<sup>17</sup> These estimates are corroborated by the following, among others:

- Nigeria has the largest mobile market (phone users) in Africa, supported by growing broadband infrastructure and Internet connectivity. An analysis by Global System for Mobile Communication Association (GSMA) suggests that Nigeria has over 97 million unique mobile subscribers with a 49 per cent penetration which is expected to rise to 55 per cent by 2025.<sup>18</sup>
- From a continental perspective, increasing Internet penetration by 10 per cent can potentially increase GDP per capita by 2.5 per cent, while increasing Internet access to 75 per cent can create 44 million jobs on the continent.<sup>19</sup>

Digital transformation across sectors of the economy is expected to have a positive impact on job creation by boosting employability of the labour force, especially of the most qualified young people, and has the potential to accelerate achievement of the goals set out under Agenda 2063, adopted by the African Union (AU). For countries in Africa, the digital economy offers opportunities but also brings risks of being left behind. Improved digital connectivity can achieve the desired transformational impact on economic opportunity and inclusive growth. This can be achieved when combined with improvements in digital skills and literacy, coverage of digital identity schemes, and access to digital payments and other financial services, as well as digital support to start-ups and existing businesses. With such capabilities, African economies can harness digital data and new technologies, generate new content, link individuals with markets and government services, and roll out new and sustainable business models.

<sup>&</sup>lt;sup>17</sup> Jobberman, Digital sector skills gap report, 2020 page 17.

<sup>&</sup>lt;sup>18</sup> GSMA Spotlight on Nigeria: Delivery a Digital Future 2018 page 2.

<sup>&</sup>lt;sup>19</sup> International Finance Corporation, e-Conomy Africa 2020 page 12.

There are two sides to the potential effect of digital transformation on employment. With automation of the economy, AI becomes the major driver of innovation and growth instead of labour being a significant aspect of value creation. Securing jobs could become hard for even the most educated population as companies increasingly rely on technology rather than labour. On the other hand, digital transformation is expected to alter the mix of available jobs and the nature of current jobs.<sup>20</sup> It is expected to offer a lifelong learning process for workers to upskill and reskill. The jobs dividend can be realized by shifting activity to the formal economy to create stable and decent jobs. Digital transformation also offers an opportunity to remove the barriers facing companies when they start the formalization process and extend employment service to a great proportion of the labour force, including those in remote areas. Broadly speaking, technical and organizational innovation can help firms enlarge their workforce. In developing economies, there has been an explosion of new methods for unskilled individuals to use digital technologies especially in rural areas, where simple mobile phones are being used to perform economic functions. With this, information asymmetry is eliminated leading to more trade opportunities and increased productivity.<sup>21</sup>

The International Finance Corporation (IFC) estimates that about 230 million jobs will be created globally that will require digital skills and estimates suggest that digital transformation will create further 3 million jobs in 2027.<sup>22</sup> Nigeria is amongst Africa's largest digital markets and the continent's top investment destination. It is estimated that about 28 million workers across all sectors need to either reskill or upskill through digital transformation due to digital skills mismatch.<sup>24</sup> It is projected that 46 per cent of activities in Nigeria will be automated<sup>25</sup>, and therefore, about 57 million jobs (35 to 40 per cent of jobs) will require digital skills within the next few years.<sup>26</sup>

#### 1.5 Youth employment outcomes and aspirations

Nigeria is Africa's most populous country accounting for almost half of Africa's population. With an estimated population of 206.3 million in 2020, it is the seventh largest and one of the fastest growing populations in the world. According to United Nations projections, the population of Nigeria will reach 410 million, the third largest in the world by 2050. With about 60 per cent of its population under the age of 25, Nigeria has one of the youngest populations in the world. Due to persistently high total fertility rates, the population is expected to remain young far into the future. A predominantly young population holds promises for demographic dividends if the conditions are right, especially in the labour market, but could spell demographic disaster if otherwise.

According to national statistics, the population of 15- to 34-year-olds accounts for 30 per cent<sup>27</sup> of the total population, 56.1 per cent of the working-age population and 43 per cent of the

<sup>&</sup>lt;sup>20</sup> IPPR Building the Workforce of the Future, 2018 page 7.

<sup>&</sup>lt;sup>21</sup> World Bank Group, Africa pulse COVID-19 and the Future of Work in Africa: Emerging Trends in Digital Technology Adoption, Volume 23 2021 page 81.

<sup>&</sup>lt;sup>22</sup> Jobberman, Digital sector skills gap report, 2020, page 17.

<sup>&</sup>lt;sup>23</sup> World Bank, Demand for Digital Skills in Sub-Saharan Africa, 2021 page 25.

<sup>&</sup>lt;sup>24</sup> Jobberman Digital sector skills report, 2020 page 27.

<sup>&</sup>lt;sup>25</sup> Jobberman Digital sector skills report, 2020 page 21.

<sup>&</sup>lt;sup>26</sup> World bank Demand for Digital Skills in Sub-Saharan Africa, 2021 page 5 and 11.

<sup>&</sup>lt;sup>27</sup> Based on data on page 6 of Nigeria Living Standards Survey (2018/2019), A Survey Report by the Nigerian National Bureau of Statistics (in collaboration with the World Bank).

labour force in 2020, with labour force up slightly from 42 per cent in 2010.<sup>28</sup> From labour statistics, youth unemployment rate increased six-fold over the decade from 7 per cent in 2010 to 43 per cent in 2020. Underemployment (part-time employment) was initially higher than unemployment rates, rising from 22 per cent in 2010 to 27 per cent in 2017 but fell below the unemployment rate thereafter and returned to 21 per cent in 2020.<sup>29</sup> Thus, the proportion of the youth population able and willing to work but unable to find full-time employment opportunities increased moderately from 29 per cent in 2010 to 34 per cent in 2014 before expanding rapidly to reach an all-time high of 64 per cent in 2020.



#### Figure 1.2: Youth unemployment indices (%) 2010-2020

Source: National Bureau of Statistics (NBS) Labour Market Statistics 2010-2018, Labor Force Statistics: Unemployment and Underemployment Report (Q4 2020)

Young people typically experience higher unemployment and underemployment rates than older adults due to lack of experience required for most vacancies and lack of financial and material requirements for viable self-employment and entrepreneurship. Of all unemployed adults, 90 per cent were new entrants into the labour market in Q3 2018<sup>30</sup>; young people completing education at various levels or uneducated but growing into the working age typically constitute a dominant share of this category. The slowing pace of economic growth also plays a major role in the rising youth unemployment. Gross domestic product (GDP) grew at an average rate of 6.2 per cent per year from 2010 to 2014 but dropped sharply to 2.8 per cent in 2015 and eventually recorded an average of 0.7 per cent per year for the period 2015 to 2020.<sup>31</sup> As Figure 1.2 shows, despite the disadvantages faced by young people in the labour market, there was only tepid increase in youth unemployment during 2010-2014 while it rose rapidly during the period 2015-2020.

<sup>&</sup>lt;sup>28</sup> National Bureau of Statistics (NBS) Labour Market Statistics 2010-2018, Labor Force Statistics: Unemployment and Underemployment Report (Q4 2020).

<sup>&</sup>lt;sup>29</sup> An individual is classified as employed (full-time employment) if he/she worked for a minimum of 40 hours during the week, underemployed if he/she worked for at least 20 hours but less than 40 hours, and unemployed if unable to work for a minimum of 20 hours per week.

<sup>&</sup>lt;sup>30</sup> NBS, Labour Force Statistics 2010-2018, Q3 2018 (Data on reasons for unemployment).

<sup>&</sup>lt;sup>31</sup> Gross Domestic Product at Constant Basic Prices downloaded from CBN Statistical database; Gross Domestic Product Report (Q4 and Full Year 2020) published by NBS.

Labour force participation rates are historically lower among young people than the aggregate adult population due primarily to education and training. However, unfavourable labour market outcomes in recent years have discouraged many young people, further weakening labour force participation. The Covid-19 pandemic further depressed the rates to as low as 51 per cent among 18 to 34-year-olds in 2020, although aggregate rates also dipped to 63 per cent for the aggregate working-age population.<sup>32</sup> Overall, it is estimated that an average of 30 per cent of those aged between 15 and 24 years old were "not in employment, education or training" (NEET) between 2010 and 2019. These include the unemployed, discouraged (not seeking employment) and those unable to seek employment due to other reasons. While unemployment had been rising, independent analysis of labour market data during the decade 2010-2020 also shows that an average of 30 per cent of new entrants into the labour market, typically young people, enter through part-time jobs<sup>33</sup>, reflecting the weakness of the economy to absorb the new entrants. The limited capacity to absorb the new entrants into the labour force, with absorption rates estimated to be about 10 per cent<sup>34</sup>, is explained in part by gaps in the education system that limit the acquisition of employability skills (technical skills and soft skills), limitations of platforms for employer-jobseeker matching, and cultural and structural conditions leading to marginalization of women and young people.<sup>35</sup>

The tightening window of opportunities for young people in the labour market is already shifting their interest away from white-collar jobs towards self-employment and entrepreneurship especially for young men. This is reflected in findings of a 2020 nationwide survey of women and men (15- to 29-year-olds) conducted by Nigeria Youth SDGs Network in collaboration with the UN Department of Economic and Social Affairs, the ILO and the Federal Ministry of Youth and Sports Development. The study shows that while completing education and training (including apprenticeships and vocational training) ranked as the leading factor for finding a decent job (45% women and 38% men), the next most important factor is the ability to fund a business (19% women and 27% men). The study concludes that overall, 37 per cent of the young people "either think that funding for a business or having the right training to know how to start a business are most important to obtain a decent job"<sup>36</sup>.

There are important differences in the sectors where young people aspire to be employed and those driving employment in the economy as reported in a nationwide survey of young women and men (2020) (see Figure 1.3). While the agriculture sector accounts for 48 per cent

<sup>&</sup>lt;sup>32</sup> Based on various studies, aggregate labor force participation rate in Nigeria historically ranged between 75 per cent and 80 per cent. The rates for 2020 represent the averages for Q2 2020 and Q4 2020. Source: NBS, Labor Force Statistics: Unemployment and Underemployment Report. Abridged Labour Force Survey Under Covid-19 (Q2 2020) (August 2020); Labor Force Statistics: Unemployment and Underemployment Report (Q4 2020) (March 2021).

<sup>&</sup>lt;sup>33</sup> Helpman Development Institute (2020), The Enterprise Sector and the Nexus Between Economic Growth and Employment in Nigeria: Lessons from the Last Decade and Need for Policy Re-orientation, Unpublished Manuscript.

<sup>&</sup>lt;sup>34</sup> This is credited to the Minister of Youth and Sports Development during a speech titled "Digital Skills Gap, Bane of Nigeria Unemployment" at the 2021 Annual Luncheon of the illustrious Government College, Ibadan, Old Boys Association (GCIOBA) at Jogor Centre in Ibadan on Sunday August 15, 2021. Accessible online through <u>https://tribuneonlineng.com/digital-skills-gap-bane-of-nigeria-unemployment-%E2%80%95-sunday</u> <u>-dare/#:~:text=%E2%80%9CThere%20is%20a%20digital%20skills</u>,10%20per%20cent%20absorption %20rate.

<sup>&</sup>lt;sup>35</sup> This gap in human capital optimization is at the core of the inefficiency in Nigeria's labour market as Nigeria captures only 49 per cent of its full human capital potential, compared to a continental average of 55 per cent, ranging from 67 per cent in Mauritius to 44 per cent in Chad (see <u>https://www3.weforum.org/docs/ WEF\_EGW\_FOJ\_Africa.pdf</u>).

<sup>&</sup>lt;sup>36</sup> Nigerian Youth Employment Action Plan (NIYEAP) 2021-2024, Federal Ministry of Youth and Sports Development, Section 1.3.

of jobs available in Nigeria, a reduced fraction (32%) of young people wish to work in the sector. There is no significant difference in respect of industry: the sector generates 7 per cent of employment and 8 per cent of young people want to work there. The main differences are in two segments of the services sector. Compared to the general workforce, a greater proportion of young people want to build career in health and social services (11% versus 3%) and in sales and retail services (21% versus 14%).



Figure 1.3: Share of employment and youth aspirations by sector (%)

Source: NBS, Employment by Sector Report Q3 2017 (January 2018); Nationwide survey of young people (15-29 years old) conducted by Nigeria Youth SDGs Network in collaboration with the UN Department of Economic and Social Affairs, the ILO and the FMYSD (2020)

These aspirations are consistent with findings from a recent SIFA/ILO assessment of the impact of Covid-19 on the labour market in Nigeria.<sup>37</sup> The findings of the study in which 81 per cent of participants were aged from 18 to 35 years-old show that home delivery of goods and services accounts for 44 per cent of trending opportunities (34% home deliveries – 10% home-based care). Production and delivery of healthcare goods and services is next at 36 per cent (26% healthcare products; 10% home delivery of healthcare services). Taken together, 80 per cent of emerging opportunities during the pandemic are in sectors where young people are aspiring to build careers. Better still, the COVID-19 pandemic seems to have shifted aspirations of young people toward healthcare services. Findings from the current assessment will contribute to our understanding of this trend and clarify whether this shift is temporary or permanent.

On the demand side, the employer component of the SIFA/ILO assessment provided information on the job requirements for the emerging opportunities. From the survey, job-specific technical skills (28%) are equally as important as administrative, customer relations and related skills (28%), consistent with shift toward home/office delivery services occasioned by the pandemic. Apart from these, digital skills (19%) emerged as the next important requirement. The ranking is similar when employers were asked to identify the priority skills required to fill jobs lost during the pandemic. The responses were: technical skills (26%), people management skills (22%) and

<sup>&</sup>lt;sup>37</sup> SIFA/ILO Rapid Skills Assessment of Reskilling and Upskilling Needs in Response to the Covid-19 Crisis. The assessment was undertaken under the auspices of the ILO-Implemented Skills Anticipation component of the Skills Initiative for Africa (SIFA) Project of the African Union Commission (AUC) and the African Union Development Agency (AUDA-NEPAD), with financial support from the European Union and the German Government.

#### Assessment of skills supply and demand in the digital economy in Nigeria, including digital skills

digital skills (22%). However, the view is different when the unemployed were asked to identify the key skills required to re-enter employment. On their own part, they listed digital skills as the highest priority (27%) ahead of technical skills (19%) and administrative, customer relations and related skills (19%).

# 2 Policies, strategies and frameworks for digital skills and youth employment

#### 2.1 Policies, frameworks and strategies

In line with global reforms, the Nigeria's ICT sector was reformed through market liberalization, privatization of public enterprises and establishment of independent regulatory institutions. The Federal Executive Council (FEC), the highest decision-making body in Nigeria, approved a national information technology policy in 2001. Implementation of the policy commenced with establishment of the National Information Technology Development Agency (NITDA), an agency under the supervision of the Federal Ministry of Communications. This agency was created to ensure the achievement of the national information technology vision of the country, foster and co-ordinate the accelerated development of information technology (IT) in Nigeria and promote efficiency and international competitiveness of the IT industry in Nigeria (Enakrire, 2011).

In 2017, the federal Government of Nigeria released the Economic Recovery and Growth Plan, which recognizes the central role of ICT in driving economic growth and development.<sup>38</sup> In line with this, the federal government developed the Nigeria ICT Roadmap 2017-2020 which provided an integrated framework for ICT development in Nigeria and articulates the strategic direction on four pillars namely: Governance; Policy, Legal and Regulatory framework; Industry and Infrastructure; and Capacity Building. The roadmap further provides guidelines for multistakeholder approach to ICT sector development in order to accelerate national development through the inclusion of women, young people and vulnerable groups. The overall vision of the federal government is to "make the ICT sector the main pillar of the economy in Nigeria and to mainstream ICT into all aspects of national life"39 by engaging all key stakeholders in order to implement the roadmap effectively. The ICT roadmap was succeeded by the Strategic Roadmap and Action Plan 2021-2024 (SRAP)<sup>40</sup> developed and anchored by NITDA and inspired by the vision of NDEPS. The goal of SRAP is to drive NITDA efforts and realign its operations toward a new vision: "to proactively promote Nigeria's development into a sustainable digital economy." The plan emerged out of a visioning process to refocus the agency on government policies, the current condition of the IT industry, future trends, and existing citizenship goals, as well as the overall government intention.

The Federal Ministry of Communications was re-designated as the Federal Ministry of Communications and Digital Economy (FMoCDE) in October 2019 and charged with the acceleration of the digital economy. The extant digital economy policy, the National Digital Economy Policy and Strategy (NDEPS) 2020-2030 was immediately developed by the Ministry to accelerate economic diversification and development by accelerating the growth of the digital economy. It plans to support the digital literacy of citizens, businesses and government workers and enable them to acquire cutting-edge digital skills and achieve a 95 per cent digital literacy

<sup>&</sup>lt;sup>38</sup> See Ministry of Budget and Financial Planning (2017).

<sup>&</sup>lt;sup>39</sup> National Planning Commission (2009).

<sup>&</sup>lt;sup>40</sup> NITDA STRATEGIC ROADMAP AND ACTION PLAN (SRAP 2021-2024) - NITDA

level by 2030. The eight pillars of the strategy are targeted at creating the enabling environment for the digital economy through developmental regulations, infrastructure development (solid, soft and service infrastructure), promotions (digital society and emerging technologies) and incentives (indigenous content creation and adoption); and strengthening demand and supply sides through digital services development and digital literacy skills respectively. Under the skills pillar, the government aims to provide policy backing for massive training of people from all walks of life in order to enable them to obtain digital literacy and other digital skills. Each pillar of the strategy offers a set of implementation techniques, as well as particular activities that the government must perform. As a national strategy, the federating units (i.e., the states and local governments) are encouraged to cascade these policies and initiatives in order to foster concerted effort toward the goal of transforming Nigeria into a leading global digital economy that provides quality life and digital economies for everyone.<sup>41</sup>

The NDEPS aligns with the Economic Recovery and Growth Plan (ERGP) 2017-2020 objective of economic growth and diversification.<sup>42</sup> The policy objective is to have every Nigerian connected with the Internet in order to achieve the goal of a digital Nigeria where everyone is computer literate, owns a digital device, has access to the Internet and owns a bank account that can be accessed and operated digitally and online. In line with the global trend in business transactions, the policy aims to strengthen the economy and increase transparency, competitiveness and integration of Nigeria into the global economy. The policy objective was sustained in the Nigeria Economic Sustainability Package (NESP) 2020, the NGN 2.3 trillion stimulus plan to offset the effects of the recession and maintain social stability and serve as a transition between the ERGP and the successor Medium-Term National Development Plan (MTNDP) 2021-2025<sup>43</sup>. Under the MTNDP, the government aims to commence automation of policy implementation, monitoring and evaluation; and develop skills enhancement frameworks in the public sector. Specifically, the strategy for the digital economy, bio-economy, science, technology and innovation sector includes policy amendment and implementation to improve the legal frameworks, infrastructural development and financial/technical support for the digital ecosystem through local and foreign investments. The strategy on education and human capital development sector also includes prioritization of skills development for employability, improvement in digital literacy proficiency, improvements in the quality of education and sustainable financing of the education sector. The success of the digital economy in Nigeria depends largely on availability of ICT infrastructure, its development, upgrading, deployment and utilization. The current drive by the Government of Nigeria for a digital economy will no doubt increase economic development and global competitiveness.

Digital skills for youth employment and entrepreneurship are also emphasized in youth, education and employment policies and action plans. The National Youth Policy (NYP) 2019<sup>44</sup>, which targeted the 15 to 29 years age group, has five strategic thrusts that are considered fundamental to enable young people to transit to self-fulfilled and productive adulthood. Under the strategic thrust of productive workforce and sustainable economic engagement of young people, the policy aims to foster the development of this group into "a productive and committed workforce through appropriate quality education and skills development, adequate

<sup>&</sup>lt;sup>41</sup> <u>file (ncc.gov.ng)</u>

<sup>&</sup>lt;sup>42</sup> Zubairu, et al., (2020).

<sup>&</sup>lt;sup>43</sup> See <u>https://nationalplanning.gov.ng/wp-content/uploads/2021/03/Nigeria-MTNP-2021-2025-Overview-of</u> <u>-Draft-Plan.1.pdf</u>.

<sup>&</sup>lt;sup>44</sup> National Youth Policy: *Enhancing Youth Development and Participation in the context of Sustainable Development*, Federal Ministry of Youth and Sports Development 2019 Edition.

opportunities for productive employment and successful entrepreneurship that will enable them to live economically empowered lives and make sustainable contributions to national development, as well as strategically position the country for the achievement of demographic dividends."<sup>45</sup> Under this policy thrust, the youth and ICT benchmarks are set to:

- i) build the capacity of at least one million youth in basic, mid-level and advanced digital skills;
- ii) channel funding to youth entrepreneurs in the ICT sector through accelerators and incubators;
- iii) ensure adequate facility in all public secondary schools and tertiary institutions for teaching in computer science, ICT and ensure digital literacy for all secondary school and tertiary institution students;
- iv) develop mentorship programmes to support the creation of youth start-ups by already established ICT businesses.

The Ministry of Communications and Digital Economy is leading the implementation of these objectives along with the Ministry of Science and Technology, Ministry of Education, Galaxy, NITDA/NITDF and FMYSD.

The National Employment Policy 2017 examined the labour market and productivity challenges, identified eleven intervention areas and enumerated objectives, measures, strategies and institutional framework to meet the challenges of rising unemployment and underemployment. Overall, the goal of the policy is to align the education and skills development system with the needs of industry and commerce. In the first intervention area – human capital development, employability of labour force, skill acquisition and application – the policy requires the Federal Ministry of Education (FMoE) to foster a functional education and skills training system. To achieve this, the FMoE, in collaboration with other stakeholders is required to pay more attention to workforce development activities – education, training and development of skill sets demanded in the labour market. FMoE is required to identify the workforce needs of the labour market, ensure that tertiary institutions are producing the skills that employers require, and develop the foresight to terminate ineffective and obsolete protocols and procedures in the education system at all levels. The Ministry also is charged with the responsibility of coordinating a national initiative to address the skill gaps that threaten the preparedness of new entrants to the labour market. The four objectives in this intervention area are:

- i) to improve the quality of teaching profession and provide appropriate incentives for teachers;
- ii) to align education system and skills training with the demand of the labour market;
- iii) to develop a suitable framework to stimulate an ICT-driven education sector; and, iv) to ensure involvement of industry in education, training and skill development.

Activities to achieve objective iii) include:

- a) collaboration of tertiary institutions with Digital Bridge Institute (DBI) and other ICT-based institutions to design and organize scalable technology-driven teaching methods for teachers to ensure that students acquire the necessary skills in demand at the labour market;
- b) increase in budget allocation for vocational education and training, and investment in modern tools required to raise a generation of talented youth workforce ready for the changing dynamics of the workplace; and

<sup>&</sup>lt;sup>45</sup> National Youth Policy 2019, p. 10.

c) creation of incentives to encourage young girls, particularly those in schools, to embrace STEM and ICT.

On the demand side, the leading intervention area - private sector growth, cooperatives, MSMEs and job creation - has objectives to:

- i) enhance the capacity of businesses in the private sector to drive the economy and lead in employment generation and labour absorption;
- ii) improve access to credit facilities for MSMEs;
- iii) empower small businesses; iv) improve market access for MSMEs;
- v) improve physical infrastructure; and
- vi) support cooperative societies for employment creation.

Emphasis is made in reference to supporting growth and expansion of businesses (local and foreign) in employment-intensive sectors, and efforts toward encouraging young people to become entrepreneurs. A national employment council has been formed to oversee the implementation of the NEP, and it includes a wide range of stakeholders, including the Federal Ministry of Youth, Sport and Development (FMYSD).<sup>46</sup>

Nigerian Youth Employment Action Plan (NIYEAP) 2021-2024 enumerated strategies for achievement of decent and productive youth employment under four priority areas: employability, entrepreneurship, employment and equality and rights. Key strategic actions for employability include expanding access to education and training opportunities, promotion of skills development in sectors with high labour-intensity and ensuring that graduates have the skills and capabilities required by industry. Under entrepreneurship, key strategic actions include promotion of youth-led entrepreneurship and support for entrepreneurs in five sectors including agro-business and the digital economy, support for access to credit and business development services, and promotion of enabling environment for emergence of youth-friendly large-scale agro-based private commercial enterprises in all the 36 states and FCT. Key strategies under employment priority area are focused on provision of employment services to young people including through the provision of mentorship programmes for upcoming entrepreneurs, by strengthening labour market information system to aid job matching, and deliberate efforts to promote youth employment in specific sectors including security services, tourism and in value-chains. Key strategies under the equality and rights priority ensure gender equality in employment opportunities, with a special emphasis on vulnerable groups. They include support for vulnerable groups through training and access to services and information, promotion of non-discrimination and equality of treatment for all workers and extension of social security to the informal sector. In particular, the last priority area - equality and rights - was informed by the realization of inequality in the implementation of youth employment programmes, due to factors such as disproportionate focus on young women and low-income individuals; less emphasis on young people with disabilities; lack of interventions targeting the young with low levels of education and those who drop out of education.

The National Social Protection Policy 2017-2020 provides a framework to establish "a gendersensitive and age-appropriate framework to ensure a minimum social floor for all citizens for a life of dignity". Policy measures under the "Livelihood Enhancement and Employment" category include "Labour based cash transfer/Public Works Programmes for Youths, persons with disabilities and the unemployed (Policy Measure 9)" and "Provide support for sustainable

<sup>&</sup>lt;sup>46</sup> The National Employment Policy of Nigeria (2016).

livelihood through skills training, access to land, inputs for smallholder farmers, affirmative action for youth and women's employment, and access to financial services for micro and small enterprises and cooperatives (Policy Measure 10)". The National Social Protection Policy (NSPP Draft 2021)<sup>47</sup> aims to improve on the extant NSPP (2017-2020) to address, among other issues, current realities of rising youth unemployment and underemployment, needs of persons with disabilities, need to pay special attention to women and girls, rising urban poverty particularly among those engaged in the informal sector, displacements due to insurgencies and banditry, and to harness the renewed awakening of the spirit of private sector corporate social responsibility (CSR).

The N-Power programme under the Federal Ministry of Humanitarian Affairs, Disaster Management and Social Development is aimed at 18 to 35-year-olds for the purposes of addressing the challenge of youth unemployment and advancing social development, and to prepare young Nigerians for a modern, globalized economy by helping equip the young with skills and certifications for emerging global markets"<sup>48</sup>. Its programmes address both graduates and non-graduates. Graduate programmes are targeted at "under-developed" sectors including agriculture, education and healthcare while non-graduate programmes are targeted at building and construction, utilities, automotive repairs and aluminium/gas.

The findings of this assessment will either provide baseline information for design of initiatives or information to evaluate the interventions being implemented by government agencies and other stakeholders in their efforts to improve digital literacy and create opportunities for young people in the digital economy.

#### 2.2 Youth digital literacy

The National Digital Economy Policy and Strategy (2020-2030) aims to achieve 95 per cent digital literacy by 2030. The policy objectives include:

- integration of digital literacy and skills into the national education curriculum at all levels;
- support for training and capacity-building of public sector employees in the development and use of digital tools and applications to improve the delivery of government services;
- creation of a pool of Nigerians with digital skills validated by globally recognized certifications;
- bridging the gap between the academia and industry; and
- lowering the access barrier to digital tools for the citizens.

Computer literacy constitutes the entry point of an individual into the digital economy. According to National Survey of Youth (2020),<sup>49</sup> only about a quarter (24.5%) of the national youth population is computer literate. In the survey, an individual is considered computer literate if he/she is capable of doing at least one of the following: browsing the Internet, using word processing software, produce graphics and designs, using specialized software packages, or having IT certification. Although no geopolitical zone attained 50 per cent computer literacy, the rates are South-South (40.1%), North-Central (39.1%), South-East (35.8%), South-West (20.3%), North-East (11.9%) and North-West (9.4%).

<sup>&</sup>lt;sup>47</sup> Revised Draft National Social Protection Policy, Federal Ministry of Finance, Budget, and National Planning, Abuja, June 2021.

<sup>&</sup>lt;sup>48</sup> National Social Investment Management System, <u>https://nasims.gov.ng/</u>

<sup>&</sup>lt;sup>49</sup> National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020).



Figure 2.1: Youth computer literacy rates by zone

Source: National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020)

Figure 2.1 shows the distribution of digital skills in the youth population. Nationally, 93.3 per cent of the computer literate youth can browse the Internet; 41.4 per cent can use word processing software; 15.6 per cent can produce graphics and designs; 11.6 per cent can use specialized software packages; and 5.4 per cent are certified IT professionals. There are variations across geopolitical zones in the type of digital skills available among the computer literate youth.<sup>50</sup>





Source: National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020)

<sup>&</sup>lt;sup>50</sup> Counting each "yes" response to the questions of possessing the skills as one (1), an ordering of the aggregate scores in decreasing order yields a ranking of the zones on digital skills as North-East (218.2), South East (183.2), South-South (167.8), North-Central (164.6), North-West (156.8) and South-West (145.6). However, when these scores are weighted by the zonal literacy rates, the ranking places the South-South (68.3) as leading, followed by North-Central (64.3), South East (65.6), South-West (29.5), North-East (26.0) and North-West (14.8).
Given the zonal variation in availability of digital skills, an examination of the demand for digital skills across the zones will be instructive on the extent of existing gap. There are observed gender gaps in computer literacy across the zones which are generally higher in the North than in the South, with the gap most pronounced in North-Central zone (12.8%) and least in South-South and South-East (3.3%) zones.



Figure 2.3: Gender gap in literacy rates by zone

Source: National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020)

High rates of poverty and illiteracy, the urban-rural development gaps, disadvantages faced by women and girls in socioeconomic opportunities, and low investment in human development are factors hindering the closing of digital gender skills gaps.

### 3 Methodology and fieldwork

### 3.1 Data sources

The methodology has four components:

- Background reading on currently available information relevant to the assessment. This
  includes a review of existing policies and strategies related to the digital economy and
  employment opportunities for young women and men; analysis of digital and e-commerce
  platforms (desk review) with a view of informing the choice of geographic areas and
  economic sectors to further focus the digital skills assessment on; existing literature
  on digital economy and employment issues; context and data from major relevant
  stakeholders to digital skills and labour market including the National and State Bureau of
  Statistics, labour and employment agencies, national policies on employment, education
  and training.
- Survey of enterprises/organizations in target sectors. Based on initial assessments carried out, the survey prioritized ten sectors: wholesale and retail trade (including e-commerce), information and communication technology (ICT), agriculture, forestry and fishing, finance and insurance, arts, entertainment and recreation, health and social services, public administration, manufacturing, construction, education and transportation and storage.<sup>51</sup> The survey sought to answer the following questions:
  - How are digital technologies spreading in the workplace and what are the driving forces?
  - What types and levels (basic, intermediate, advanced) of digital skills are emerging in the workplace?
  - o How is demand for skills including digital skills changing in the workplace?
  - What levels of complementarities and substitutions are going on between digital and non-digital skills?
  - How do these changes vary across sectors and across occupations within sectors?
  - How are organizations and enterprises meeting the digital skill requirements and bridging the skill gaps?
  - Are there training opportunities or learning platforms that employees are leveraging to learn the digital skills to function on their jobs?
  - How has the government been supportive of training on digital skills required in the workplace?

<sup>&</sup>lt;sup>51</sup> The selection of target sectors was based on triangulation of information and data from several sources reflecting priorities of the government and leading drivers of growth and employment. 1) The ERGP 2017-2020 under the "job creation and youth empowerment" component of the strategic objective "investing in our people", emphasized prioritization of "youth-dominated" sectors including ICT, creative industries and services, and recommends concerted efforts to encourage the young to participate in "labour intensive" sectors including agriculture and construction. 2) The leading employment sectors, based on data from NBS Employment by Sector Report Q3 2017 (published in January 2018) in decreasing order are: agriculture, wholesale and retail trade, manufacturing, professional, scientific and technical services, education, transportation and storage, health and social services and construction. 3) Leading growth sectors, based on average annual growth for the 3-year period from analysis of data from CBN Statistical Database, are information and communications, water supply, sewage and waste management, finance and insurance, agriculture, arts, entertainment and recreation, transportation and storage, health and social services, and manufacturing.

- How youth-friendly are the emerging employment opportunities?
- What are the challenges young people face in accessing them?
- Survey of 18 to 34 year-olds. On the supply side, survey respondents include all subgroups including the employed, unemployed, discouraged. The survey seeks an understanding of the target audience their aspirations, skills and skill gaps. The survey sought to answer the following questions:
  - What are the aspirations of the various population groups in relation to the labour market?
  - What skills do they consider important for their career aspirations?
  - What are the differences between skills they considered important and the reality in the workplace?
  - What gaps are there between the skills (especially digital skills) acquired in school of training institutions and those demanded by their current job roles?
  - How are the workers bridging their digital skill gaps?
  - How well-informed about the digital skills requirement of their intended field of endeavour or desired career?
  - What kinds of skills, including digital skills do the unemployed need to find employment in their desired career areas?
  - What types and level of digital skills are they interested in?
- Consultations and in-depth interviews with key training providers including formal and informal vocational and technical education institutions, key government agencies, business associations, employee representatives and sector/industry experts.

The assessment team leveraged several electronic platforms (WhatsApp, SMS and Email) to administer the online questionnaires. Targeted communications with specific organizations and individual workers and targeted use of social media were undertaken. Email targeting, online forums, chat groups and mobile calls were also used to obtain responses.

### 3.2 Fieldwork implementation

The fieldwork has four components

- Online employer survey form was shared through various platforms including Employer Associations (NECA, NASME, NACCIMA) platforms to be disseminated to members very minimal success; deployment of enumerators to visit companies with print versions of the questionnaire in 13 states (2 states per geopolitical zone plus Lagos); enumerators were used to balance the distribution of respondents from the employer association platforms.
- Online individual survey form was shared through various platforms including Youth SDGs network platforms and databases, use of call centres to make calls to databases collated from various sources including alumni registers and student associations (survey completion rates are very low, about 10%), Dissemination through campus fellowships and associations. In addition, the team engaged enumerators at community levels to canvass survey responses
- The study team reached out to eleven providers of digital skills training and industry associations and experts. The responses were predominantly positive and most respondents were excited to be interviewed. The principle of thematic analysis was followed in analysing the in-depth interviews. All the interviews were transcribed to a word document, all interviews were treated as one text in its integrity. It was read through several times to develop a thorough understanding and overall picture.

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• The team made efforts to reach out to contacts in the government ministries, departments and agencies. Letters were addressed to ministers and directors and were followed up with offices assigned to respond. Eventually, interviews were granted by two ministries, the Ministry of Labour and Employment and the Ministry of Communications and Digital Economy, and one agency, the Digital Bridge Institute.

### 3.3 Data analysis and presentation

The fieldwork has four components

- Survey data was analysed using Pivot Tables in Microsoft Excel to produce tabulations and cross-tabulations to examine distributions of variables of interest within group, sector or location. The tabs and cross-tabs are presented in clustered and stacked bar charts.
- The principle of thematic analysis was followed in analysing the in-depths interviews. All the interviews were transcribed to a word document, all interviews were treated as one text in its integrity. It was read through several times to develop a thorough understanding and overall picture and identify the themes emerging from the texts.

### 3.4 Classification of digital skills

The study adapted a classification of digital skills at three levels - basic, intermediate and advanced. The types of skills and their classifications are summarized below.

### Table 1: Types of skills and their classification

Basic	<ul> <li>Hardware skills (Using a keyboard / a smartphone; operating touch-screen technology)</li> <li>Software skills (using Internet browser; downloading apps and handling information; Word processing (e.g. Microsoft word; excel and PowerPoint; managing files on laptops; managing privacy settings on mobile phones)</li> <li>Online operations (Email; search; or completing an online form; digital interaction and communication (email; social media and basic transaction); safety; scan for viruses)</li> </ul>
Intermediate	<ul> <li>Desktop Publishing (producing printed matter with the computer using a layout programme that integrates text and graphics)</li> <li>Digital Graphic Design (designing visuals; video and audio content using technology)</li> <li>Digital Marketing (preparing online advertisement and marketing campaigns)</li> </ul>
Advanced	<ul> <li>Coding and mobile app development (creating; developing or adjusting an app or digital platform)</li> <li>Big Data and analytics (analysing big data sets using technology)</li> <li>Artificial intelligence and virtual reality; Internet of Things and/or cybersecurity</li> </ul>

Source: The framework reflects the continuum of digital skills based on ITU, Digital Skills Toolkit (Page 7)

### 4 Characteristics of survey respondents

### 4.1 Employers: Demography

A total of 3 015 employers responded to the survey. The leading share of sector respondents are wholesale and retail (19%), information and communication technology (13%) and the creative sector, comprising arts, entertainment and recreation (11%), while public administration (federal, state and local government institutions) accounts for the lowest share of sector employers (3%).

### Figure 4.1: Sector distribution of employers



Other demographic characteristics of the surveyed organizations are as follows:

- 37 per cent are from the South-West zone (which includes Lagos and Ogun), followed by 16 per cent from North-West (which includes Kano and Kaduna) and the least represented being the South-South (9%);
- 75 per cent of the organizations are located in urban areas with 53 per cent in large cities and 22 per cent in small cities;
- 81 per cent of the employers are private companies, followed by cooperatives at 12 per cent and non-profits at 3 per cent;
- 64 per cent are micro-enterprises (less than 10 employees), 33 per cent are SMEs (from 10 to 249 employees) and while 1 per cent are large corporations (more than 250 employees).



#### Figure 4.2: Demographic characteristics

### 4.2 Employers: Internet access and usage

Overall, email exchanges (31%) and social media (30%) account for 61 per cent of Internet usage (traffic) by surveyed organizations. Internet banking comes in third place at 12 per cent and advertising takes fourth place at 7 per cent.





Mobile phone access (via hotspots) is the most common means of Internet access cited by surveyed employers (43% of total) with the rest of the distribution being cable Internet modem (27%); mobile modem (12%); cable Internet DSL (11%); and optical-fibre Internet (4%). The dominance of mobile phone as means of Internet access holds in all geopolitical zones with exception of South-East where cable Internet DSL is the modal means and South-West where cable Internet modem is the modal means of access. Across sectors, the dominance of mobile phone also holds with the exception of ICTs, e-commerce and public administration where cable Internet modem is the dominant means of Internet access.





On average (using the modal response), both speed and reliability are sufficient for the majority, or 44 per cent, of the organizations surveyed. A quarter (25%) of the organizations reportedly would like to have faster Internet, 12 per cent would prefer a more stable/reliable Internet, while 18 per cent would like to have faster and more stable/reliable Internet. Across the geopolitical zones, about 50 per cent of organizations in all of Northern zones and the South-East have sufficient speed and reliability. In particular, Internet access is most challenging in the South-South zone and least challenging in the North-West zone.

### 4.3 Youth surveyed: Demography

A total of 2 438 young people (18 to 34-year-olds) responded to the youth survey, with 51 per cent male, 47 per cent female, and 1 per cent prefer not to say.

In terms of age groups of those surveyed, 47 per cent were 25 to 34-year-olds, 42 per cent were 20 to 24-year-olds, and 11 per cent were 18 to 19-year-olds.





A total of 65 per cent of female respondents are under age 25 compared to 40 per cent of male respondents.

About 45 per cent of those surveyed hold bachelor degrees, 22 per cent hold secondary school certificates while 15 per cent hold community college or intermediate certificates.<sup>52</sup> A total of 59 per cent are enrolled in some education or training programme of which 47 per cent are enrolled in formal education or training programmes and 12 per cent are participating in informal learning courses or activities. Another 11 per cent are enrolled but not currently attending courses.

<sup>&</sup>lt;sup>52</sup> Only 5 per cent of our sample 18 to 34-year-olds did not complete any formal schooling while a total of 66 per cent completed tertiary (post-secondary) education. In the most recent official national survey of those between 15 and 35 years of age, 63 per cent of females and 37 per cent of males reportedly never attended school. Among those who attended school (not the total population of youths aged between 15 and 35), only 17 per cent attained tertiary education (secondary 68%; primary 15%). See National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020), pages 21-22. While these rates are not directly comparable across the studies, respondents in our sample are more educated than the general youth population.



### Figure 4.6: Education and training of respondents

Women surveyed are more active in skill acquisition through education and training than men. There is a 9 per cent gap between those not currently enrolled in any programme, whether formal or informal (45% women - 54% men).

Measured by employment status, 29 per cent of the sampled youth demographic were unemployed and not engaged in any activity during the week preceding their participation in the survey.<sup>53</sup> There are no significant differences between men and women in terms of unemployment (29% women – 27% men). Respondents from large cities or their suburbs are most likely to be in paid or self-employment (47%), followed by residents of urban informal settlements (40%) while the other locations have more limited opportunities (small cities/towns/ semi-urban 29%; rural areas 31%).

<sup>&</sup>lt;sup>53</sup> This fraction (29%) should not be compared at face value with the unemployment rates published by the statistical authorities which was 43 per cent in 2020 (Labor Force Statistics: Unemployment and Underemployment Report Q4 2020). While the rate here captures only those who worked for zero hours (not engaged in any activity) during the week preceding the survey, the rates published by the National Bureau of Statistics include those who were engaged in economic activities but worked for less than 20 hours during the week preceding the survey.







### 4.4 Youth sample: Internet access and usage

Only 16 per cent of young people have unlimited access to the Internet and data all the time; 32 per cent have access all the time but not unlimited, implying that 48 per cent have access all the time. Of the remainder, 27 per cent have access several times in a week but not all the time, 19 per cent have Internet access less than once a week and 6 per cent never had access.





# As expected, large cities and their suburbs have the highest share of youth residents having unlimited access to the Internet (21%) compared to an average of 12 per cent for all other locations. However, for young people large cities do not have an absolute advantage over other areas in terms of access to the Internet and data, where 8 per cent of residents have never had access to the Internet compared to 2 per cent in small cities and other urban areas and 5 per cent in townships and informal settlements. Five leading purposes account for 63 per cent of Internet usage (traffic) by the sampled youth demographic: social media (15%), email exchanges (14%), Internet banking (12%), advertising (11%) data collection/research.

#### Figure 4.8: Internet access and data use among young people



### Figure 4.9: Tasks performed regularly while using the Internet

### 4.5 Section summary: Discussion of findings

Business activities and by implication employment opportunities are concentrated in certain regions of the country, owing to historical factors (including transnational trade and location of the country's capital) and geographical factors (such as nearness to the sea). The South-West zone which includes Lagos and Ogun is home to the majority of Nigeria's industries, followed by the North-West zone which includes Kano and Kaduna, well known for historical trading routes. These factors are incorporated into the sampling of employers across the country. Thirty-seven per cent (37%) of sampled employers are from the South-West zone, followed by 16 per cent from North-West and the least represented being the South-South (9%). The prominence of wholesale and retail trade as the leading sector of activity in Nigeria also is also well reflected in the survey.

The economy in Nigeria is predominantly a micro-enterprise economy.<sup>54</sup> This is reflected in the survey in which 64 per cent of employers are micro-enterprises (employers with less than 10 workers). Micro-enterprises tend to exhibit weak capital base and weak capacity to invest in technologies, owing to economies of scale constraints.<sup>55</sup> Micro-enterprises and small businesses face challenges on both the demand and supply sides of digital skills. On the demand side, evidence from complimentary studies show that only 1.8 per cent of micro-enterprises across all sectors have an online business setup<sup>56</sup>, mostly due to lack of resources – expertise and finance – required to manage online platforms, thus limiting their capabilities to generate jobs requiring digital skills. On the supply side, most of the providers of digital skills training, including respondents to interviews conducted for this study, are micro-enterprises. The challenges and key limitations to their ability to supply more digital skills include unstable power supply, lack of access to finance and scarcity of digital skills trainers. The combined effect of these factors leads to high costs of training, which is a key challenge for young people seeking to acquire digital skills.

<sup>&</sup>lt;sup>54</sup> Micro enterprises account for 99.8% of MSMEs in Nigeria (Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS), National Survey of Micro Small and Medium Enterprises (MSMEs) 2017).

Overall, about 68 per cent of micro enterprises start up with initial capital less of than N50,000 (in 2017 prices) and they dominantly operate as sole proprietorships with very little assets (Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS), National Survey of Micro Small and Medium Enterprises (MSMEs) 2017).

Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS), National Survey of Micro Small and Medium Enterprises (MSMEs) 2017 page 51.

Mobile phone access (via hotspot) is the leading source of Internet access cited by employers, and employer Internet usage is mainly around activities that can be conducted via mobile phone. Owing to this factor, the speed and reliability of Internet is greatly limited by the distribution of cellular base stations and strength of connectivity made available by mobile network operators (MNOs) that mainly own the fibre-optic links in Nigeria. From the survey, only 44 per cent of employers report having sufficient speed and reliability of Internet access.

About 94 per cent of the young people have some access to the Internet and nearly half (48%) have access all the time. Youth in urban areas where economic opportunities are more available and digital infrastructure is more developed have better access to Internet and data services than more remote areas. Across locations, rural and more remote areas are at disadvantage in terms of unlimited access to the Internet, perhaps due to financial constraints and technologies available in those areas. The proportion of young people having access to Internet and data all the time decreased progressively from 52 per cent in large cities and their suburbs to 48 per cent in small cities, 42 per cent in townships and informal settlements, and 37 per cent in rural areas. Five leading purposes account for 63 per cent of Internet usage (traffic) by the sampled youth demographic: social media (15%), email exchanges (14%), Internet banking (12%), advertising (11%) data collection/research.

### 4.6 Section summary: Recommendations

Government's support programme for MSMEs on digital transformation could deepen the digital economy and employment of young people if the measures are targeted at addressing the weaknesses of micro-enterprises and small businesses from both demand and supply sides.

- The targeted measures include easing access to finance for investment in digital technologies, technical support to employers, and support for employee digital skilling opportunities.
- Some of these measures are in currently in place (section 8) but are biased toward larger employers, creating the need to shift the implementation toward smaller employers.

# 5 Demand for skills by employers, including digital skills

# 5.1 The dynamics going on with employers including the extent of digitization of economic and business activities and the changing demand for skills

The digital transformation experience is largely at the early stages as the majority 62 per cent of sampled organizations have either only transformed from analogue to digital systems (48%) or are yet to experience any transformation (14%).

- Among the remaining organizations at more advanced stages of digital transformation: 22 per cent experienced the transition from a digital tool to more advanced ones while 16 per cent did undergo automation of business processes.
- Organizations across the size spectrum (measured by the number of employees), experienced all four stages of the transition with the transformation from analogue to digital systems being the dominant experience. However, automation of business processes is the leading transformation experience of large companies with between 250 and 499 employees (36%).
- Across sectors, the transformation from analogue to digital systems is also the dominant experience. However, in transportation and storage, 50 per cent of the organizations experienced more advanced stages of digital transformation (transformation to more advanced digital or automation). Leading sectors in digital transformation, where the share of employers in the more advanced stages of transformation exceed the overall average include ICT, manufacturing, health and social services, construction, finance and insurance, and public administration.





### Figure 5.1: Digital transformation experience



The digital transformation experience has been mainly a boon to the employment of skilled workers, with 41 per cent of organizations employing more skilled workers while only 10 per cent employed less, yielding a net positive effect in 31 per cent of organizations. The ranking of the net positive effect on skilled workers is public sector 58 per cent; construction 41 per cent; art, entertainment and recreation 43 per cent; ICT 42 per cent and transport and storage 36 per cent.



### Figure 5.2: Effect of digital transformation on skilled labour

The digital transformation experience has also been a boon to the employment of unskilled workers, with 38 per cent of organizations employing more unskilled workers while only 16 per cent employed less, yielding a net positive effect in 22 per cent of organizations. The ranking of the net positive effect on skilled workers is public sector and education 49 per cent; ICT 48 per cent; health and social service 43 per cent, agriculture, forestry and fishery 41 per cent; transportation and storage 40 per cent and the creative sector (arts, entertainment and recreation) 40 per cent.

### Figure 5.3: Effect of digital transformation on unskilled labour





### 5.2 Relevant digital skills, both current and emerging

Sixty-two per cent (62%) of employees in sampled organizations have only basic skills, while 19 per cent possess intermediate skills and 11 per cent have advanced skills.

- Employees with basic digital skills make up the majority of employees in all sectors ranging from 51 per cent in ICT to 73 per cent in transportation and storage. Sectors where the share of employees have intermediate skills above the average 19 per cent level are ICT (28%), arts, entertainment, and recreation (22%) and education (21%). Sectors with leading shares of employees with advanced digital skills are ICT (19%), manufacturing (17%), finance and insurance (17%) and public administration (15%).
- Employees with basic digital skills make up the majority of employees in all the geopolitical zones, ranging from 49 per cent in South-East to 78 per cent in North-East. The South-East (30%), South-South (24%) and North-Central (21%) are the zones with leading shares of employees with intermediate skills, while South-West (15%), North-Central (13%) and South-East (12%) are the zones with leading shares of employees with advanced digital skills.



### Figure 5.4: Digital skills of current employees





Employees with basic digital skills are still the most difficult to find, accounting for 35 per cent of excess demand for digital skills. Next in line is advanced skills at 30 per cent, while intermediate skills comes in third at 15 per cent of the identified skills needed but difficult to find.

- Sectors facing the highest levels of excess demand for basic skills are public administration (47%), construction (40%), finance and insurance (39%) and wholesale and retail trade (39%). At the advanced digital skills level, sectors with leading excess demand are ICT (49%), Education (39%), health and social services (38%), finance and insurance (35%), construction (33%) and creative sector arts, entertainment and recreation (32%).
- Geographically, the North-East (48%), North-West (36%) and South-West (35%) are the zones with leading shortage of workers with basic digital skills. Excess demand for advanced digital skills is most pronounced in South-South (40%), then North-East (36%) and South-West (33%).
- While intermediate skills are the skills with the lowest levels of excess demand, they are still relatively scarcer in the South (South-East 22%; South-South 19%; South-West 15%) than the North where scarcity levels are below the overall average of 15 per cent.









# 5.3 Spike in demand for specific digital skills and occupations due to digitization

The array of current and emerging digital skills and occupations from the perspectives and experiences of the stakeholders are enumerated in Table 2. In terms of distribution, advanced digital skills account for most of the skills identified by the three major stakeholders (government

representatives, private sector employer associations and training institutions) where there is a spike in demand. Next are intermediate skills, while basic skills are rarely mentioned.

5	1 I	
Training institutions	Private sector employer associations	Government
Web design, especially the web programming using HTML and Java, Graphic design, data science, Machine Learning Digital marketing Ethical hacking, Computer appreciation, Cyber Security Software Development	Graphics Design Digital Marketing Cybersecurity Programming, Web and App Development Social Media Management Data Science and Data Analytics Video Editing/Production Digital Illustration	Big Data Analytics Artificial intelligence, Blockchain, Cybersecurity Basic programming skills

### Table 2: Digital skills and occupations with spike in demand

While there are possibilities of bias toward larger employers in the assessment by the stakeholders, it is also likely that they are simply reporting information they received from employers.

# 5.4 Other employability skills (foundation skills, core skills, soft skills, business management and entrepreneurship skills, transferrable technical skills), both current and emerging

Employers report that foundational literacies are the most difficult to find employability skills (13%), followed by communication skills (11%), other languages (7%), emotional intelligence (7%), strategic thinking (6%), creative and innovative thinking (6%), collaboration and teamwork (5%), and analytical and critical thinking (5%).

- Foundational literacies are generally more difficult to find in the North, where they account for an average of 19 per cent of other employability skills difficult to find (North-West 22%; North-East 18%; North-Central 17%), compared to the South where they account for about only 9 per cent.
- The shortage of communication skills is nearly uniform across Nigeria as their share of non-digital employability skills difficult to find range between 10 per cent and 12 per cent across the zones. A similar pattern of minor variation in the shortage level is observed for other/foreign languages.
- However, it is harder to find foundational literacies in the North than it is to find communication skills, while in the South, finding communication skills is more challenging than finding foundational literacies.

### Figure 5.6: Other skills difficult to find





### 5.5 Section summary: Discussion of findings

The economy in Nigeria is largely at the early stage of digital transformation, with 62 per cent of employers either yet to invest in digital technologies or have only embraced basic digital technologies. This experience is the same for employers of all sizes except companies with 250-499 employees that are dominantly at the stage of automation of business processes. Investment in digital technologies have substantially raised demand for both skilled and unskilled workers. The employment effect is realized as demand for the use of technology in every facet of life raises both direct demand for workers with relevant digital skills and indirect demand for workers with other skills to carry out new tasks along the value chain.<sup>57</sup>

<sup>&</sup>lt;sup>57</sup> This viewpoint emerged from interview with Nigeria's Employers Consultative Association (NECA)

Being at the early stage of digital transformation, it is expected that most of the jobs requiring digital skills will need basic level of skills. Accordingly, 62 per cent of current employees have only basic digital skills compared to 19 per cent for intermediate digital skills and 11 per cent for advanced digital skills. Employees with basic digital skills make up the majority of employees in all sectors and in all geopolitical zones. Intermediate skills are employed mostly (as a share of all digital skills) in ICTs, creative sectors (arts, entertainment, and recreation) and education while advanced skills are mostly employed in ICT, Manufacturing, finance and insurance and public administration. Geographically, intermediate skills are employed by organizations mostly (as a share of all digital skills) in the South-East, South-South and North-Central while advanced skills are mostly employed in South-West, North-Central and South-East.

There are regional variations in the difficulty of finding digital skills, and shortage of digital skills at the different levels can be attributed to different factors.

Workers with basic digital skills account for the largest share (35%) of skills that employers are reportedly having difficulties to find in Nigeria<sup>58</sup> and the leading zones where employers are having difficulty are North-East, North-West and South-West. Given that most employers are at the early stage of digital transformation, it is a rational expectation that most jobs will require only basic skills. On the supply side, youth digital literacy rates remain quite low as only a quarter of young people in Nigeria are digitally literate<sup>59</sup> based on data from statistical authorities, thus creating excess demand for basic skills. When disaggregated to zonal level, the statistics show that North-East, North-West and South-West zones have the three lowest rates of youth digital literacy,<sup>60</sup> consistent with the finding from this survey. Notably, two of these three zones – North-West and North-East – are the leading zones where foundational literacies are difficult to find relative to other employability skills.

Advanced digital skills account for 11 per cent of current employment of digital skills but make up 30 per cent of digital skills that employers are reportedly having difficulties finding, indicative of acute shortage. Ranked by the share of skills difficult to find, the leading sector having difficulties finding advanced digital skills are: ICT (49%), Education (39%), health and social services (38%), finance and insurance (35%), construction (33%) and creative sectors (arts, entertainment and recreation) (32%). Regions of Nigeria where employers are mostly having difficulty finding advanced digital skills (as a share of digital skills difficult to find) are South-South (40%), North-East (36%), and South-West (33%). Advanced digital skills account for the majority of skills identified by training institutions, private sector associations, and government agencies, as those for which demand is spiking.<sup>61</sup>

Intermediate digital skills account for the lowest share (15%) of skills that are difficult to find, suggesting that finding workers with skills in this category is easy compared to basic and advanced levels of digital skills. This view is corroborated by responses to in-depth interviews

<sup>&</sup>lt;sup>58</sup> A respondent to in-depth survey is of the view that instead of looking for employment, the motive for acquiring basic skills may be "to start up their own SMEs and run their own café, or run their own small printing and laminating business of their own where they can do typesetting and printing". It could be that returns to basic skills are not encouraging in paid employment.

<sup>&</sup>lt;sup>59</sup> National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020).

<sup>&</sup>lt;sup>60</sup> See Figure 4, "Youth Computer literacy Rates by Zone" based on National Bureau of Statistics and Federal Ministry of Youth and Sports Development: National Survey of Youth (2020).

<sup>&</sup>lt;sup>51</sup> Eight (8) out of 10 digital skills training institutions who responded to the question "What are current and emerging skills needs in the digital economy" identified skills at the advanced digital skills level as the foremost skill sets.

with digital skills training providers who highlighted the fact that young people have largely been focused on acquiring intermediate digital skills. Advice from digital skills providers to young people has been that intermediate skills, not basic skills, are imperative for employment. As noted by a respondent, "... the basics is important, but ... doesn't get you the required skill sets to get employed". This view largely pervaded the guidance offered to young people, as noted by another respondent: "initially, we normally tell people to go to web design, go to digital Marketing, ...". This guidance led to a situation in which intermediate skills became relatively cheap for employers, as noted by other respondents: "Like they use to say the middle level is where you can find a whole lot of people", and "most organizations recruit intermediate level people en-mass because the salaries are not that high, it is within the comfort zone of these organizations, so they can recruit people (at) intermediate level en-mass".

Although, intermediate level digital skills are relatively easy to find, the supply gap is more apparent in the South than the North.

Employers report that foundational literacies are the most difficult to find of the non-digital employability skills, and this difficulty is experienced most in the Northern regions: North-West (22%), North-East (18%) and North-Central (17%). In addition, the lack of foundational literacies is more challenging than the lack of communication skills in the North, while finding communication skills is more challenging than foundational literacies in the South.

### 5.6 Section summary: Recommendations

Geographical variations in the shortage of different categories of digital skills offer direction for design of interventions:

- Interventions to meet current excess demand for basic digital skills should be targeted toward the North-East, North-West and South-West zones.<sup>62</sup>
- To meet emerging needs for basic digital skills in the future, interventions should be targeted at integrating the basic digital skills into the educational curriculum during the mandatory nine years of basic education from primary through junior secondary schools. This will ensure that individuals who discontinue schooling at that point to enter the labour force will already have basic digital skills.<sup>63</sup>
- Interventions to boost supply of advanced digital skills are needed mostly in the South-South, South-West and North-East.
- Interventions to boost supply of intermediate skills should be focused on the Southern zones (South-East, South-South and South-West) where supply is more limited relative to demand.
- Interventions to boost foundational literacy should be targeted at the Northern zones while those aimed at communications skills should be implemented in the Southern zones.

<sup>&</sup>lt;sup>62</sup> Hardware and software skills account for an average of 82 per cent of the excess demand for basic digital skills in these zones. Employers would rather hire employees who already have the basic digital skills rather than spend money on basic digital skills training. The incentives are also very low on the part of young people to acquire only basic skills for the purpose of the labour market. In this context, there will be undersupply of basic digital skills unless there are government/donor interventions to address the gap.

<sup>&</sup>lt;sup>63</sup> According to the 9-3-4 education system, an individual is expected to complete the nine years of basic education by age 15, the point at which the individual enters the working age population and likely enter the labour force.

# 6 Supply of skills among the youth labour force

## 6.1 Career aspirations and skills of young people including digital skills (basic, intermediate, and advanced levels)

A career interest in the ICT sector was cited the most among the unemployed youth respondents (20%), far ahead of wholesale and retail trade (including e-commerce) at 13 per cent, and agriculture, forestry and fishing at 11 per cent. Other leading sectors are education (10%), health and social services (8%), creative sector (arts, entertainment and recreation) finance and insurance (7% each), and public administration (6%).

- Those in the 18 to 24 years-old age group are more likely to prefer the ICT sector than those in the 25 to 34 age group. Also, the younger age group is slightly more likely to prefer wholesale and retail trade, finance and insurance while the older age group tends to want to work in agriculture, forestry and fishing, and health and social services.
- Men are about 50 per cent more likely to choose ICT and are also more likely to choose agriculture compared to women, while women exhibit higher preference for arts, entertainment and recreation and health and social services.
- Preference for ICT sector is higher among those with below university education than those who have attended university. The proportion preferring ICT is highest among those with elementary education (29%), then holders of community college/intermediate certificates (23%) and holders of secondary school certificates (22%), compared to holders of bachelor degrees (20%) and holders of postgraduate degrees (11%).
- ICT careers are most preferred by young people in North-East, South-East and South-West zones. Youths from the North clearly prefer wholesale and retail trade (including e-commerce) and agriculture, forestry and fishing, and to a lesser degree, public administration, than counterparts from the South.



### Figure 6.1: Aspirations of unemployed young people and skills requirements





Sector you would like to work the most by education								
Wholesale and retail trade (incl. e-commerce)		Information	Information and Communication (ICT)					
Agriculture, forestry and fishing	Finance &	Finance & insurance activities						
Arts, entertainment and recreation	Health and	Health and social services						
Public administration		Manufactu	Manufacturing					
■ Construction		Education	Education					
Transportation & storage		I do not cu	I do not currently seek to be employed					
Other								
Secondary education	14%	22% 7%	<mark>-8% 7% 6% <b>5%</b>3</mark>	<b>%% 10% 3% 11% 2%</b>				
Post-graduate (master's/doctorate)	11% 11%	<mark>/ 11% 3<b>%</b> :</mark>	16% <b>9% 5%</b> 8	3% <u>19%</u> <b>5%</b> %				
Elementary	19%	29%	10% 14%	14% <b>5%5%%%</b>				
Don't know	17%	8% 10% 6%	10% 8% 4% 6%	<b>2%%6%</b> 17%0%				
Did not complete any formal schooling	18%	7% 24%	13% 9%	7% <b>4% 7%</b> 4% <b>%7%</b>				
Community college/Intermediate	18%	23%	15% <mark>5% 6% 8</mark>	% <b>4%%</b> % 10% 3 <b>%%</b> %				
Bachelor's degree	10% 2	20% 12%	7% 8% 10% 6	<mark>% 6%2% 12% 4%2%</mark> %				



# 6.2 Digital skills needed to find employment in the sector of interest (basic, intermediate, and advanced levels)

When asked about the digital skills needed to find employment in the sectors of interest, basic digital skills came up 52 per cent of the time, intermediate digital skills 23 per cent of the time and advanced digital skills 19 per cent of the time.

- The proportion of young people who require intermediate and advanced digital skills clearly increases with age of respondents (Intermediate: 19% among 18- and 19-year-olds rising to 24% among 25 to 34-year-olds. Advanced: 12% among 18- and 19-year-olds rising to 23% among 25 to 34-year-olds).
- A significantly higher proportion of men require advanced digital skills than women (22% and 15% respectively) while the proportions at basic and intermediate levels are closer.
- A higher proportion of young people with less than university education perceive the need for basic digital skills than those with a degree or higher those with elementary education (52%), holders of secondary school certificates (55%), then holders of community college/ intermediate certificates (61%), compared to holders of bachelor degrees (49%) and holders of postgraduate degrees (48%).
- Geographically, the perceived need for basic skills is highest in the North-West (58%), North-Central (55%) and South-South (54%). The perceived need for intermediate skills is most notable in North-East and South-East (27% each), while the perceived need for advanced digital skills is most notable in the South-West and North-Central (23% each) and South-East (20%).



#### Figure 6.2: Digital skills needed to find employment in the sector of interest









# 6.3 Factors keeping young people from finding work including the role of digital skills and discouragement

Lack of information about jobs or how to apply is the leading challenge for employment in the sample, accounting for 16 per cent of itemized factors. Other leading factors are lack of work experience (12%), lack of digital skills (11%), lack of qualifications (10%), limited local vacancies (10%). Technical skills were mentioned 8 per cent of the time, and employability skills 5 per cent of the time. While lack of information about jobs or how to apply is the leading challenge for both men and women, other important challenges stood out:

- Limited availability of jobs locally and lack of work experience and qualifications.
- For 18 and 19-year-olds, the main challenges were educational qualifications and experience, and in addition to these, for 20 to 24-year-olds, the lack of digital skills was added, while limited vacancies in areas of interest/qualification and work experience was included by 25 to 34-year-olds.
- Educational challenges:
  - lack of information about jobs or how to apply are the leading challenges for holders of community college or intermediate certificates and bachelor degrees;
  - limited vacancies in areas of interest or qualifications are the leading challenges for holders of post-graduate degrees (masters/doctorate);
  - lack of tertiary education (diplomas/degrees) is the leading challenge for holders of elementary and secondary school certificates; and
  - lack of completed secondary education is the leading challenge for those who did not complete any formal schooling.
- Across geographical zones, lack of information about jobs or how to apply is the leading challenge in South-West, South-South, North-Central and North-West; lack of tertiary diploma/degree is the leading challenge in South-East while lack of work experience and lack of digital skills tie as leading challenges in North-West.



### Figure 6.3: Causes of unemployment among young people









### 6.4 Level of skills and competencies among young people

On average, 67 per cent of employed youth are familiar with basic digital skills, having used the skill either a lot (52%) or infrequently (15%). This proportion drops to 48 per cent for intermediate digital skills and 28 per cent for advanced digital skills. The proportion of employed youth who know about digital skills but do not have them or have them but do not use them are: 15 per cent for basic digital skills, 34 per cent for intermediate digital skills, and 47 per cent for advanced digital skills. Likewise, the proportion of employed youths who have never heard of digital skills or have heard of digital skills but do not know what it refers to are: 18 per cent for basic digital skills, 18 per cent for intermediate digital skills, and 24 per cent for advanced digital skills.

In comparison, the employed youth are more likely to have used intermediate and advanced skills relative to the unemployed youth while the unemployed have used basic skills more than the employed. In general, the unemployed are also more likely to know about digital skills (all levels) but not have them or have them but not used them compared to the employed.

Level of Skill	Used a lot or little	Know about it but do not have it or have not used it	Never heard about it or do not know what it means	Total
		Employed		
Basic	67%	15%	18%	100%
Intermediate	48%	34%	18%	100%
Advanced	28%	47%	24%	100%
		Unemployed		
Basic	71%	19%	9%	100%
Intermediate	36%	49%	13%	100%
Advanced	20%	55%	25%	100%

### Table 3: Familiarity with digital skills among young people

### Figure 6.4: Familiarity with digital skills among young people





### 6.5 Youth preparedness for the labour market

With the levels of digital skills reported by young people, employers are of the view that this group is well prepared for the labour market, as a combined 92 per cent of employers consider their preparedness to be sufficient, good or very good.

### Figure 6.5: Youth preparedness for labour market



In spite of the highly favourable rating by employers, an overwhelming majority (90%) of the unemployed youth also agree or strongly agree that improved digital skills would enhance their employability.

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### Figure 6.6: Digital skills and employability



### 6.6 Types and level of digital skills of interest to young people

The distribution, across levels, of digital skills needed for current work among the employed is not significantly different from the digital skills that jobseekers perceive they need in order to find employment:

- Employed: basic 54 per cent; intermediate 23 per cent; advanced 18 per cent.
- Unemployed: basic 52 per cent; intermediate skills 23 per cent; advanced skills 19 per cent.



#### Figure 6.7: Digital skills needed for current work

In addition to digital skills, there are other essential skills for good prospects in the labour market. As noted by a youth group representative, "There are several soft skills lacking in young people. Communication skills are very important but this is not taught in schools. Negotiation skills is important also. Respect is necessary in the workspace. Managers will surely need to be respected. Such respect is necessary for organizational growth. Attitude to work and good work ethics are also very important. I will mention emotional intelligence. Colleagues must learn to speak emotionally, apply common sense when they talk so as not to offend the other person. Artistic and tech skills are necessary as well" (An IDI Respondent from Generation Connect).

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### 6.7 Need for development of digital and other employability skills

Financial support (money to pay for the training) ranks as the leading challenge faced by young people to develop digital skills and other employability skills. Other leading factors are information about which skills are important and information about where the skills can be acquired, hardware (phone/laptop computer) and access the Internet, practical experience, connectivity, motivation and community learning centres. Notably, information on important skills combined with where they can be acquired is more of a concern than the money needed to pay for course fees for both employed (26% and 16%) and the unemployed (24% and 17%).

### Figure 6.8: Constraints to acquisition of digital and employability skills among the employed



### Figure 6.9: Constraints to acquisition of digital and employability skills among the unemployed



While affordability (paying for the courses) was identified as the leading challenge in developing digital skills, providers of digital skills training contend that their prices are fair and affordable relative to the value of the services they provide. Other affordability-related challenges are also important constraints, including access to devices (phone/laptop) and the Internet.

### 6.8 Section summary: Discussion of findings

In this survey, job seekers preferred the ICT sector most, followed by wholesale and retail trade, agriculture, forestry and fishing, education, health and social services, arts, entertainment and recreation, finance and insurance, and public administration. The preferential order of the aspirations differs from responses to similar questions asked in a youth survey conducted during the heat of the COVID-19 pandemic in 2020<sup>64</sup>, where agriculture/food was the leading sector of interest followed by wholesale and retail, health and social services, and manufacturing. Young men are twice as likely as young women to show interest in the ICT sector. Those with bachelor and postgraduate degrees are less interested in ICTs than those who do not have this level of education. Also, the sector is most preferred by young people from South-West, South-East and North-East zones.

Basic digital skills were mentioned 52 per cent of the time, compared with 23 per cent for intermediate digital skills and 19 per cent for advanced digital skills in response to the question about digital skill that jobseekers need when looking for employment in their sectors of interest. Less educated job-seekers (below degree level) require basic digital skills more than holders of bachelor and postgraduate degrees. However, the perceived need for basic digital skills is most prevalent in North-West, North-Central and South-South, which are clearly not the zones where the ICT sector is the preferred sector. The perceived need for intermediate digital skills is most notable in North-East and South-East, which are among the zones where a career in the ICT sector is most preferred. Also, the perceived need for advanced digital skills is most notable in South-Central and South-East. An ICT career is most preferred in two out of these three zones. This suggests that young people interested a career in ICTs understand that they will require intermediate and advanced digital skills in order to fulfil their dreams.

Lack of information about jobs and how to apply are the leading obstacles to employment among the sampled youth demographic, followed by lack of work experience, digital skills, and education. The survey also shows that job-seekers face employment challenges due to their educational status, including lack of completed secondary education for those who did not complete formal schooling, lack of tertiary education (diplomas/degrees) for holders of elementary and secondary school certificates, and limited vacancies in areas of interest or qualifications for post-graduate degree holders. However, holders of community college or intermediate certificates and bachelor degrees are mostly challenged by lack of information about jobs or how to apply.

Possession of basic digital skills does not seem to predict or correlate with being employed. Rather, a higher percentage (71%) of the unemployed compared to 67 per cent of the employed possess basic skills. However, possession of intermediate and advanced digital skills seems to predict being employed, evident by the 11 per cent gap in possession of intermediate digital skills (48% versus 36%) and an 8 per cent gap in possession of advanced digital skills between

<sup>&</sup>lt;sup>64</sup> Nationwide survey among young women and men (2020) 15-29 years old conducted by Nigeria Youth SDGs Network in collaboration with the UN Department of Economic and Social Affairs, the ILO and the Federal Ministry of Youth and Sports Development.

employed and unemployed youth (28% versus 20%). These numbers are consistent with the narrative from in-depth interviews indicating that having basic digital skill does not translate into employment, and that intermediate skills are necessary to secure employment. Ninety per cent (90%) of young people surveyed either agree or strongly agree with the view that improved digital skills will enhance their chances of getting a job.

Young job-seeker understanding of workplace-related digital skills (evaluated in terms of distribution across the tiers of digital skills) is similar to the understanding that young workers need to do their jobs. It thus appears that there is free flow of information about job requirements between the employed and unemployed, perhaps powered by social media, social networks and counselling from digital skill training institutions. This is buttressed by the finding that 92 per cent of employers consider the preparedness of young people for the labour market to be sufficient, good or very good. However, out of work young people cite the lack of information about jobs or how to apply, a lack of work experience, and a lack of digital skills as the leading factors keeping them unemployed. It appears that challenges with job searches, work experience, and digital skills are pressing issues in addressing youth unemployment.

The lack of access to information on the labour market stands out as one of the principal constraints that limits the acquisition of digital and employability skills among both employed and unemployed youth. When asked "What do you need so you can develop digital or other employability skills?", the combination of responses "information about which skills are important" and "information about where I can acquire the skills" amounted to 26 per cent of employed youth responses and 24 per cent of the unemployed, ahead of affordability (money/ financial support) at 16 per cent among the employed and 17 per cent among the unemployed youth.

### 6.9 Section summary: Recommendations

Investment in labour market information dissemination (to serve the needs of job search and information about what skills are required and where to get them), work experience and advanced digital skills, play pivotal roles when addressing the youth unemployment:

- Investment in labour market information dissemination is required at two levels.
  - 1. A publicly funded labour market information system (LMIS) that captures job vacancies from industry, the location of the vacancies, the skills required, and the skills offered by education and training institutions.
  - 2. Career counselling and job placement services should be revived and networked with the national LMIS to enable students in educational and training institutions to acquire the information they need to navigate the labour market.
- To address the work experience challenge, the existing Students' Industrial Work Experience Scheme (SIWES), which currently applies to a segment of undergraduate programmes could be extended to all undergraduate programmes in all universities, polytechnics, and post-secondary colleges and institutes.
- Interventions to boost supply of digital skills should address intermediate and advanced level skills as two-thirds of job-seekers already have basic digital skills. Support for basic skills could target young people who do not have a degree, who are interested in the ICT sector and who have identified a need for basic skills.
# 7 Skill gap analysis

# 7.1 Excess demand/shortage of digital skills and occupations experienced by employers

The leading roles requiring digital skills are microwork platforms (28%), website management (12%) and website design (10%). Roles requiring advanced digital skills are desktop/support technician (6%), data analyst (6%), ICT engineer (5%), and software developer (5%). The ordering of the top three roles requiring digital skills is the same in all sectors analysed.

- Microwork platforms account for at least 20 per cent of digital roles in the ICT sector and a maximum of 36 per cent of digital roles in public administration. Other sectors where microworkers are most engaged are construction (35%), education (35%), health and social services (33%), transportation and storage (32%), agriculture, forestry and fishing (32%), wholesale and retail trade (30%).
- Microwork accounts for the highest proportion of roles requiring digital skills in North-East (35%), North-West (33%) and South-West (29%) and the lowest in South-East (13%).
- Across geopolitical zones, website management and website design (combined) account for 30 per cent of roles requiring digital skills in South-East, 26 per cent in North-East and North-West, 25 per cent in South-South, 20 per cent in North-Central and 17 per cent in South-West.



#### Figure 7.1: Roles requiring digital technology (by percentage, zone and sector)





Microwork platform roles, accounting for 16 per cent of roles requiring digital skills, are the hardest to fill by employers. Other leading roles requiring digital skills that are difficult to fill include website management (10%), website design (9%), data analysis (6%), software development (6%) and ICT engineering (5%).

- Microworkers on online platforms are the most difficult to find in all sectors (highest share of digital roles difficult to find by sector), and with the exception of the manufacturing sector, website management is the hardest role to fill by employers.
- Across geopolitical zones, microworkers on online platforms are most difficult to find in the North-East (32%), followed by South-South (20%) and North-West (19%). For other notable roles, website management is most difficult to find in North-East and South-East; while web design is most difficult to find in South-East and North-West.

#### Figure 7.2: Digital roles difficult to fill (by percentage, zone and sector)







Microwork platform roles are the digital skills that employers expect to need most in the next five years, accounting for 15 per cent of digital roles needed by that time. Other leading roles are website management (12%), website design (10%), data analyst (7%), software developer (6%) and ICT Engineer (6%).

- The sectors anticipating the need for microworkers on online platforms more than any other category are wholesale and retail trade (including e-commerce), ICTs, health and social service, finance and insurance, agriculture, forestry and fishing, and public administration. In other sectors, employers expect to need website management skills most in transport and storage, manufacturing; education, construction, and arts, entertainment and recreation.
- Across geopolitical zones, the anticipated need for microworkers on online platforms is highest in North-East (28%) and North-West (17%), website management is highest in North-East (15%) and South-South (13%) while website design is most anticipated in South-South (14%), South-East (11%) and North-East (11%).

# Figure 7.3: Digital technology roles needed in the next five years (by percentage, zone and sector)



Roles	needed in the next five years by sector
<ul> <li>Microworkeronanonlineplatform</li> <li>Desktop/SupportTechnician</li> <li>Dataanalyst</li> <li>Cyber/ITSecuritySpecialist</li> <li>Data/BigDataAnalyst</li> <li>Unsure</li> </ul>	WebsitemanagementWebsitedesignSoftwareDeveloperICTEngineerDatascientistUX/UIDesigner/DeveloperIoTSpecialistCloudArchitectSpecialistBIDeveloperOtherRefusedElement
Wholesale and retail trade (incl. e-commerce)	20% 11% 9% 4% 5% 5% <b>5% 2%2%2%2%</b> %% 24% 1%
Transportation & storage	<b>10% 15%</b> 6% <b>5%</b> 8% 6% <b>5% 5% 5% 5% 3% 3% 3% 3% 3% 3% 3% 3</b>
Other	9% 9% 9% 7% 9% 6% 7% 3% 2% 20% 2%
Manufacturing	8% 18% 15% 6% 6% 5% 9% 3%2%2%3%3% 15% 1%
Information and Communication (ICT)	<b>12% 9% 10% 7% 8% 9% 7% 5% 7% 3%5%</b> 5%4 <b>%</b> 4%%
Health and social services	<b>18%9%</b> 8% <b>4%</b> 5% <b>7%10%7%2%%%%%3%</b> % <b>12%</b> 1%
Finance & insurance activities	<b>18% 11% 9% 4% 6% 4% 5% 5% 3% 4% 5% 5% 5% 5% 5% 5% 5% 5</b>
Education	<b>12%</b> 14% 8% 6% 3% 10% <b>13% 10% 13%</b> 10% <b>13%</b> 11% 0%
Construction	9% 13% 9% 6% 7% 9% 9% 8% 3%4%3%4%2%3%8% 7%1%
Arts, entertainment and recreation	<b>14% 15% 12% 5% 8% 5% 7% 4% 3% 2% 3% 14% 1</b> %
Agriculture, forestry and fishing	20% 8% 3%3% 8% 5%1%28% 23% 1%
Public administration	<b>18% 11%</b> 9% <b>7% 6% 4% 10% 9% 1%%%</b> 5%1%5% 9% 0%



For young people, knowledge of digital platforms mirrors the tasks performed on the Internet, and the most well-known digital platforms, measured by knowledge of how they work and whether they can help to make money are: social media (76%), e-commerce platforms (72%), logistics and delivery (66%), ride-hailing platforms (62%) and freelance/professional services platforms (51%).<sup>65</sup> On the other hand, the least known platforms are: microtask work (51%), programming (51%), domestic or personal services (51%), healthcare (52%), digital points of sale (52%), and apps to buy stock (54%).

<sup>&</sup>lt;sup>65</sup> These are the platforms for which the proportion of young people who know about them (knowledge of how they work and whether they can help to make money) exceed the proportion who do not know about them (not having heard about them or have heard about them but don't know how they work).



Figure 7.4: Knowledge of digital platforms

### 7.2 Sectors experiencing excess demand/shortage of digital skills

A number of training institutions suggested that agriculture, engineering and manufacturing, hospitality and education sectors have experienced the largest skill gap, while others suggested that all sectors have a measure of digital skill gap. A respondent commented: "I know that in agriculture there is little improvement. The health sector is trying its best to use the data in the right way. However, based on the information I have, the manufacturing sector is yet not there. Those in the agriculture sector are finding ways to move their goods online so that people beyond our shores will be able to see it".

The hospitality sector needs to improve digital skills. A respondent commented: "if you look around the industry the application of digital skills or digital components is low. Look at the education sector, schools are going digitalized. The economist and the accountant are also using some advanced tools such as some computer programming, but in the hospitality industry, what do they do in the industry, probably nothing almost nothing, except for hotels that use software, but besides hotels, there isn't much. The tourism business and even game reserves lack digital skills. They hardly employ people with digital skillsets."

**Data professionals are needed in all fields including in engineering and construction**. While a respondent identified a digital skill gap in both engineering and construction as well as manufacturing sector, he added: *"if I'm to add another one, I'll just say data and data professionals. Because right now the world everything is dealing with data? As long as we can gather data, then we can get insights and predictions from them and plan better".* 

**The education sector is also lacking digital skills**. Some teachers have practically refused to upskill to become digitally in tune with reality. A respondent said: "Some teachers do not know even how to create instructional materials rather than creating them they use handwritten notes and dictate such as notes."

# 7.3 Digital skills supply among those looking for work and the discouraged youth

In general, the employed youth are more likely to have used intermediate and advanced skills relative to unemployed youth, who have used basic skills more than the employed. The unemployed are also more likely to know about digital skills but not have them or used them compared to the employed.

# 7.4 Perceived mismatch between the digital skills supply and demand, and the nature of the mismatch

Respondents were asked to assess the extent to which their digital skills are matched to the needs of their current jobs if employed, and the needs of jobs they find interesting. The rating was on a scale of 1 to 10 where 1 is relative to having none of the skills required and 10 means having all the skills required. The ratings among the employed youth yielded: mean = 6.7, median = 7, mode = 7; and among the job seekers: mean= 5.7, median = 6, mode = 7. While the modal assessment was 7 for both groups, the employed scored themselves one step higher on average using the mean and median scores.



#### Figure 7.5: Digital skills matching among the employed



#### Figure 7.6: Digital skills matching among the unemployed

### 7.5 Section Summary: Discussion of findings

Employers are overwhelmingly of the view that young people are well prepared for the labour market (92%). Self-assessed matching between skills acquired and skills required in the labour market among both employed and job seeking young people shows some level of mismatch, with employed reporting an average of 70 per cent and the unemployed reporting an average of 60 per cent.<sup>66</sup>

Microworkers on online platforms, typically not carried out in-person by employees of organizations but by short-term freelancers to perform specific tasks,<sup>67</sup> account for the leading share of roles requiring digital skills currently employed by the sampled employers (28%). In particular, they make up the highest proportion of digital roles currently employed, digital roles difficult to find and digital roles that will be needed in the next five years in both North-East and North-West zones. Microworker platforms could represent one of the means of improving availability of digital skills across Nigeria in the face of challenges to free movement of labour due to security. Given the likelihood that most employers expect to use these platforms in the future, it is important that young people are made aware of and understand these platforms. Presently, 51 per cent of young people do not know how microtask platforms work (not heard about microwork or heard about it but don't know how it works).

Website management (12%) and website design (10%) are the next most cited roles requiring digital skills. Website management skills are the most difficult to find in North-East and South-East; while web design skills are the most difficult to find in South-East and North-West. Similarly. In the next five years, the anticipated need for website management is highest in North-East and South-South while the anticipated need for website design is highest in South-South, South-East and North-East.

The combination of the next five important roles - desktop/support technicians, data analysts, ICT engineers, software developers and data scientists - account for 25 per cent of roles currently employed, 27 per cent of roles currently difficult to fill and 29 per cent of roles that will be needed in the next five years, implying perhaps increased importance of these roles in Nigeria.

### 7.6 Section summary: Recommendations

Government should look into the operations of digital labour platforms in Nigeria, in particular microwork platforms in respect of digital skills, to understand how they work and examine how to promote them among young people. This could, in addition to smart regulation of the platforms, increase supply to meet digital skills shortages and, in particular, help improve supply of digital skills in the North-East and North-West, areas affected by security challenges.

<sup>&</sup>lt;sup>66</sup> The question asked is: "In general, would you say your digital skills are well matched to the needs of your current job? Please give your rating on a scale of 1 to 10, where 1 means you have none of the skills required, and 10 means you have all the skills required.

<sup>&</sup>lt;sup>57</sup> A review of the two common microworker platforms often cited by young people shows that they are open to individuals with intermediate and advanced digital skills. In Fiverr, the typical options are graphics and design, digital marketing, writing and translation, video and animation, programming and tech, and data. In Upwork, the categories available include accounting and consulting; admin support; customer service; data science and analysis; design and creative; engineering and architecture; IT and networking; web, mobile, and software development. The roles classified under these categories are available to all levels of digital skills. Thus, the levels of skills being sought from microworkers on online platforms vary from basic to advanced, thus the prominence of microworker on online platforms is more likely a strategy for filling various levels of digital roles rather than searching for a specific level of digital skill. It also appears that the platforms can source digital skills for freelance, short-term and medium-term engagements.

Information about skills required by the market and where to get the skills should be provided as part of a publicly funded labour market information system in order to reduce the level of skills mismatch among young people.

Interventions to boost supply of website management and web design could be prioritized in North-East, South-East, North-West and South-South, while efforts should also be made generally to boost supply of desktop/support technicians, data analysts, ICT engineers, software developers and data scientists could be more general.

# 8 Digital skills training institutions, platforms and opportunities

# 8.1 Employer-based training including in-house training programmes and outsourcing

In-person formal training programmes outsourced to accredited training providers is the dominant form of learning and development opportunity provided by employers to their staff members (21%). Next are in-person trainings/workshops (11%), apprenticeships (10%), mentoring/on-the-job learning (10%), online formal training programmes with accreditation (9%), blended learning opportunities (9%), internship (8%), online workshops or training without accreditation (8%) and self-spaced online learning (5%).



#### Figure 8.1: Learning and development opportunities provided by employers

Digital skill courses offered through outsourcing to training institutions include software and hardware engineering, and computer networking courses. Others are professional ICT courses such as computer basics; software development, web development, python programming, Java, Oracle Database, C#, hardware; data science/machine learning; cyber security; project management; graphic design; and digital marketing among others.

However, not all employers provide learning and development opportunities. For those nonproviders, the factors advanced for non-provision include non-affordability and absence of need for such opportunities, as workers are fully skilled. This is perhaps driven by recruitment of staff who demonstrate the skills at the point of engagement.



Figure 8.2: Reasons for lack of learning and development opportunities

Sixty-five per cent (65%) of employers who train staff do so often or very often while 33 per cent does so rarely, perhaps once in a while.



Figure 8.3: Frequency of learning and development opportunities

# 8.2 Government interventions and programmes in digital skills acquisition

The majority (48%) of sampled employers did not receive any assistance from government, either in cash or in kind, and 6 per cent of respondents are unsure. Among those who received assistance, the assistance was in the form of grants (18%), relevant information on digital skills (10%), training/capacity building (9%) and other types of technical support (9%).



#### Figure 8.4: Government assistance for digital skills acquisition

Employers who received grants, capacity-building or other forms of technical support are concentrated in the South-West and North-West zones (South-West – 48 per cent; North-West – 45%). The proportion of organizations receiving such in the other zones are South-South – 29 per cent; North-East – 26 per cent; North-Central – 26 per cent; and South-East – 18 per cent. Sharing of relevant information on digital skills was the major support received by employers in the South-East zone.

#### Figure 8.5: Government assistance for digital skills acquisition by geopolitical zone



Government assistance in form of grants, capacity-building or other forms of technical support is graduated in decreasing order by size of organization: large companies (100-249) – 58 per cent; large companies (500 or more) – 48 per cent; medium (25-99) – 46 per cent, small (10-24) – 32 per cent; micro (6-10) – 40 per cent; micro (1-5) – 31 per cent. Indeed, the larger the organization, the more it tended to benefit from government support.



#### Figure 8.6: Government assistance for digital skills acquisition by size of organization

## 8.3 Section summary: Discussion of findings

Outsourcing of formal staff training programmes to accredited training providers is the most common means by which employers provide employees with learning and development opportunities. These opportunities are usually for intermediate and advanced digital skills.

Government interventions and programmes in digital skills acquisition in the form of grants, capacity-building, and other forms of technical support were mainly targeted at the industrial areas of Nigeria (South-West and North-West zones) and benefitted larger more than smaller employers, with micro and small employers least likely to benefit. Low capital base of micro and small businesses in relation to the cost of digital technologies will prevent them from investing in necessary technologies and providing employee development opportunities, thus making digital transformation less likely for smaller employers.

### 8.4 Section summary: Recommendations

Development partner interventions in digital skills development should be focused on smaller employers in order to compliment government interventions that are focused on larger employers.

- These interventions should be biased toward basic digital skills where employers rarely provide employees with learning and development opportunities, and young job-seekers have weak incentives to invest in them.
- Learning from employers, development partner interventions could be delivered in partnership with or through outsourcing to digital skill training institutions.

# 9 Collaboration to address digital skills shortage

The implementation of the recommendations to address the digital skills shortage can leverage existing or potential types of collaboration.

*Collaboration between employers and digital skills training institutions*: In this collaboration, employers outsource recruitment for roles requiring digital skills to training institutions that on behalf of the employer either shortlist current or past trainees, or advertise, interview and shortlist candidates for the roles. An example is the collaboration between New Horizon Nigeria, a digital skills training institution and Julius Berger, Transmission Corporation of Nigeria (TCN) and Cool FM Radio.

Collaboration between development partners and digital skills training institutions: This collaboration fulfils development partner programme objectives. An example is the collaboration between German Agency for International Cooperation (GIZ) and Afrihub Institute to train graduates in programming, web development, cybersecurity, data science and computer networking. Beneficiaries are recruited through a process that is open to all unemployed youth in Nigeria.

Collaboration between government, development partners big technology firms and training institutions to further digital innovation and entrepreneurship: Small and large technology firms such as IBM, Huawei, Microsoft and development partners including the World Bank, the African Development Bank, USAID, ILO, and ITU are ideal and open to such collaboration. While advanced digital skills are in acute shortage in the market, the skill sets at this level are not readily affordable for young people, and the shortage will likely persist into the future. This collaboration will heavily subsidize the supply of those skills and guarantee the growth of the digital economy and expansion of employment for young people.

Intragovernmental collaboration between government agencies: Collaboration between the Ministry of Communications and Digital Economy (MCoDE) and the ICT departments of all ministries and agencies is necessary to address the digital skills gap within the public sector, perhaps with involvement of the Office of Head of Service to enable MCoDE train, develop, and supply digitally skilled personnel to ICT units of all government ministries, departments and agencies.<sup>68</sup> Another example of intra-governmental collaboration is the case of MCoDE collaboration with state governments to conduct digital job training in 12 states as part of the implementation of the National Digital Economy Policy and Strategy. This type of collaboration between MCoDE and Small and Medium Enterprise Development Agency of Nigeria (SMEDAN) will support the digital transformation of micro-enterprises and small business.

Collaboration between industry, professional associations, institutions of higher education/ training and government agencies: This collaboration is useful to reflect industry digital skill needs in periodic curriculum reviews in higher educational and training institutions. The

<sup>&</sup>lt;sup>68</sup> This practice currently exists between the Ministry of Budget and Economic Planning (MBEP) and all other Ministries, where staff of the Department of Budget in all ministries are from MBEP.

National Universities Commission (NUC) and relevant governing institutions for polytechnics and colleges of education are the frontline agencies to represent the Ministry of Education in this process. However, many higher institutions pay lip service to this requirement, with the consequence that instructional curriculums lag behind industry and practice requirements. Specifically, the digital skills required in industry should be introduced into the courses and updated periodically. This approach will enable graduates of any discipline to acquire key intermediate digital skills and develop competence in digital tools relevant to their disciplines prior to graduation.<sup>69</sup> This collaboration is also necessary for the development of a labour market information system (LMIS).

<sup>&</sup>lt;sup>59</sup> This will help to address skills deficiency challenges such as the frustration expressed by two digital skill trainers: "What you have now are lecturers using old notes and doing handouts and manuals. I have IT students taking my class and most of them are talking about Fortran 77. And this is a programming language that was done 1977. And we are now talking about Python. Today we are talking about Java scripts. And teaching them Java and they don't have access to the system to learn the Java. They are writing codes on papers. So, these are the things we face, we have to go back to the scratch and start lecturing them. It is that bad...". "The problem with university education, (we have spoken about this in the past few days) is that although it is very specific to research and communicated in an academic way; the truth is, the real world is not academic. Digital skills have really disrupted current skillsets. I think many graduates that come out of school are not even aware of the skills that they're required to have. ...if it was added more into the curriculum, we will not be having these problems."

# **10 Recommendations**

The recommendations based on the study findings are organized into four areas: support to employers for digital transformation (demand-side), support for digital and employability skills supply (supply-side), support for skills-to-job matching. and promotion and regulation.

Support to employers for digital transformation: Government and development partner support for employers on digital transformation could deepen the digital economy and expand employment for young people if the measures address the challenges of finance and expertise faced by micro-enterprises and small businesses. Targeted measures would include:

- easing access to finance to enable employers to invest in digital and other technologies;
- technical support for employers on online business setup;
- support for employee digital skilling opportunities.

Some of these measures are in place (see section 8) but are biased towards larger employers, necessitating complementary interventions for smaller employers.

Support for digital and employability skills supply: Interventions to meet current excess demand for basic digital skills should be targeted toward the North-East, North-West and South-West zones where digital literacy levels are lowest in Nigeria. Support for basic skills should be targeted toward those with elementary education, secondary school certificates, and holders of community college/intermediate certificates. To meet emerging needs for basic digital skills in the future, interventions should be targeted at revising the basic education curriculum to integrate basic digital skills into the mandatory nine years of schooling from primary through junior secondary schools. This will ensure that everyone who attains basic education level (JSS3) would have acquired basic digital literacy (have the basic digital skills).<sup>70</sup>

Interventions to boost supply of intermediate skills should be prioritized in the southern zones (South-East, South-South and South-West) where supply is limited relative to demand. However, website management and web design could also be prioritized in North-East and North-West. These interventions could be delivered in partnership/collaboration with digital skills training institutions and development partners to subsidize training.

Interventions to boost supply of advanced digital skills are needed most in the South-South, South-West and North-East. The priority areas include desktop/support technicians, data analysts, ICT engineers, software developers and data scientists. These interventions could be delivered in partnership/collaboration with digital skills training institutions and development partners to subsidize training.

In the area of non-digital employability skills, interventions to boost foundational literacy should be prioritized in the North while interventions to boost communications skills should be prioritized in the South of the country.

Support for skills-to-job matching: Investment in labour market information system for skillsto-jobs matching is required at two levels. First, a publicly funded labour market information

<sup>&</sup>lt;sup>70</sup> According to the existing 9-3-4 education system, every child is expected to complete the nine years of basic education by age 15, and this is the entry point into the working-age population and the labour force.

system (LMIS) is required that will capture job vacancies from industry, the location of the vacancies and the skills required by the market as well as the education and training institutions including technical and vocational education and training offering the skills. The LMIS should be accessible at no cost to job-seekers, social planners, parents who are making decisions of skill acquisition for their children, and education and training institutions who need to know which skill needs are emerging in order to channel their programmes accordingly.<sup>71</sup> In addition, career counselling and job placement centres should be revived in universities, polytechnics, community colleges and intermediate level institutions. These centres should be networked with the public LMIS to enable students in educational and training institutions to acquire the information they need to navigate the labour market.

There have been efforts to develop an LMIS but no existing platform is suitable to serve this purpose. The National Electronic Labour Exchange (NELEX) hosted at the Federal Ministry of Labor and Employment (MLE) is inactive and unknown. Several initiatives of MLE to match jobseekers and employers at the state level as well as initiatives of the National Youth Service Corp (NYSC) and N-Power Program for similar purpose are severely limited in their scope and visibility. The national Universities Commission (NUC) created a partial LMIS in 2012 that focused on vacancies in manufacturing sector.<sup>72</sup> There has been no repeat study since then. Private sector investment in skill-job matching exists, for which the Jobberman portal is the most commonly known. However, the database is available only on a for-profit basis.

To address the lack of work experience, the existing Students' Industrial Work Experience Scheme (SIWES), which currently applies to a segment of undergraduate programmes, could be extended to all undergraduate programmes in all universities, polytechnics, and post-secondary colleges.

*Promotion/regulation:* Government should look into the operations of digital labour platforms in Nigeria, in particular microwork platforms in respect of digital skills, to understand how they work and examine how to promote the platforms among young people and introduce regulation of the platforms to protect workers. This strategy could, in general, support increased supply to meet the shortage of digital skills and, in particular, help improve supply of digital skills in the North-East and North-West, zones that are currently affected by security challenges.

<sup>&</sup>lt;sup>71</sup> A provider of digital skills remarked "If there is a way the private sectors can specify the skills they need their employees to have, we can channel our energy and resources into training more people to have the required skills".

<sup>&</sup>lt;sup>72</sup> The report is available at <u>http://nuc.edu.ng/wp-content/uploads/2016/02/LMOP-Report-Manufacturing</u> -Sector-2012.pdf

Annexes

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Skill Level	Institutions	Courses offered	Ownership
Technical/advanced digi- tal skills, e.g. Artificial intelligence, robotics, Automation, augmentation, big data analysis, IOTs, Cloud computing, Machine learning, Cyber security and, block-chain tech, software and hardware engineering	• Andela Nigeria,	Ruby / Ruby on Rails, Python / Django, PHP / Laravel, MEAN Stack, Mobile Development (Android and iOS)	Private
	<ul> <li>Afrihub ICT Institute, Abuja</li> </ul>	Certified Internet Webmaster, Cisco Certified Network Associate, Cisco Certified Network Professional, Oracle Database, Cyber Security, Data Science and Machine Learning, Ethical Hacking, Forensic Accounting, Python Programming, Java Programming, A+ (Pc Tech), Computer Appreciation, Computer Power User	
	<ul> <li>Innovation Institute of Technology, Akure</li> </ul>	Oracle Database administration, Cisco certification (CCNA/CCNP) Cisco certified network associate/ professional, Web Development, Certified Ethical Hacker EC-Council certified Ethical Hacker, Statistical Package for Social Science (SPSS), Desktop Application Development, Computer Office Package (Ms Word, Excel, Power Point, Publisher), Graphic Package (Corel Draw, Photoshop, in-Design, Illustrator), Cloud Computing, Big Data, IoT, Al	

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	Ownership			
	Courses offered	Project Management, Python, Software engineering, Network engineering, Infrastructure management, Data analytics, Web designing, Web development, Linux and oracle database Administration 12c, Management Information System (MIS), Network engineering, Digital marketing, CompTIA security +, Java, Networking Essentials, CCNA (V7), IT essentials A+, Cyber security, Internet of Things, Programming essentials in C++, PCAP/Python	Full stack web development, Full stack software devel- opment, Multimedia and Graphics, Certified Ethical Hacking CEH, Digital marketing and analytics, Python programming, Certified Cisco Network Administration (CCNA)	Front-end/back-end Web Design and Development, Full-stack Website Development, Python Programming for web development, MERN (MongoDB, Express.js, React.js and Node.js) Stack Web Development, MEAN (MongoDB, Express.js, Angular, and Node.js) Stack web development, Mobile App Development ( Android and iOS), Full-stack Java Programming -Web Applications, Oracle, CMS/WordPress/Web Design, E-Commerce/ Web Design And Development, ASP dot Net, C#, C++, Graphics Design, Video Editing, Motion Graphics and Visual Effect, 2D and 3D Modeling and Animation, UI/UX DESIGN, Computer Appreciation   Desktop Publishing, Computer Literacy and Office Productivity, Advanced Microsoft Office Package
	Institutions	<ul> <li>NIIT Education and Training Centres</li> </ul>	New Horizons	• Bizmarrow Technologies, Abuja
(continued)	Skill Level			

continued) Skill Level Institutions Courses offered Ownership	<ul> <li>Computer Training School, Nigeria</li> <li>Computer Training School, Nigeria</li> <li>Computer Training School, Nigeria</li> <li>Development training, Java Programming Training, GIS</li> <li>Motion Graphics Training, 2D Character Animation</li> <li>Training, Data Science, UI/UX Design Training, GIS</li> <li>Mapping and Visualization, Website Design and</li> <li>Development Training, Python Programming Training,</li> <li>Graphics Design Training, SD Modeling and Animation</li> <li>Training, Data Analytics, Digital Marketing and Cyber</li> <li>Security, Video Editing Training, Architectural and</li> <li>Structural design, Advanced Microsoft Office Training,</li> <li>Basic Computer and Computer Appreciation, Advanced</li> </ul>	Torbita Limited Abuja     Mobile App Development, Website Design, Web     Development	Techmice Abuja     Web Development, Data Science, Graphics Design.	Hiit     Ectrificate in Digital Literacy, Diploma in Information     Technology, CompTIA A+, CompTIA N+, WordPress     Training, PHP Laravel Framework, Diploma in Web     Design, Certificate in Web Programming, Oracle     Certified Associate, Oracle Certified Professional,     Oracle Business Intelligence Enterprise Edition (OBIEE),     Microsoft Project For Project Managers, Cisco Certified     Network Associate (CCNA), Cisco Certified Network     Professional (CCNP), Microsoft C# Essentials, ASP     NET/ ASP.NET MVC, Oracle Certified Associate Java SE7     ASP.NET MVC, Oracle Certified Associate Java SE7	Skill Level	<ul> <li>Computer Training School, Nigeria</li> <li>Computer Limited Abuja</li> <li>Torbita Limited Abuja</li> <li>Techmice Abuja</li> <li>Hiit</li> </ul>	Comress offered         Computer Literacy and Office Productivity, Mobile App         Development training, Java Programming Training,         Motion Graphics Training, Java Programming Training,         Motion Graphics Training, 2D Character Animation         Training, Data Science, UI/UX Design Training, GIS         Mapping and Visualization, Website Design and Animation         Training, Data Analytics, Digital Marketing training,         Graphics Design Training, Rthical Hacking and Animation         Training, Data Analytics, Digital Marketing training,         Accounting Software Training, Al and Machine Learning, Architeboard Animation         Training, Papeuelopment, Website Design, Web         Development         Mobile App Development, Website Design, Web         Development         Web Development, Data Science, Graphics Design.         Web Development, Data Science, Graphics Design.         Development         Development	Ownership
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Assessment of skills supply and demand in the digital economy in Nigeria, including digital skills

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Skill Level	Institutions	Courses offered	Ownership
	• Early code, Abuja	Python, JavaScript, Web Design, Full Stack Web Development, SQL Database, Office Essentials, Data Science, PHP Back-End Development, Python With Data Science, Android and iOS Development, Web Design (Builder Version)	
	<ul> <li>Nspire School of Management and Technology</li> </ul>	National Diploma in Software Engineering, National Diploma in Networking and System Security, National Diploma in Computer Hardware Engineering	
	<ul> <li>Oratheresa Web Development And Training Ltd, Abuja</li> </ul>	Software Engineering, Forex Trading, Web Design, Digital Marketing, Computer Appreciation, Full Stack Development	
	<ul> <li>Parach ICT Academy, Ibadan</li> </ul>	UI/UX Design, Digital Marketing, Data Analysis, Front End Web Design, Python Programming, Java Programming, Back End Web Development, WordPress Web Design, Full Stack Web Dev, AI and Machine Learning, Software Development, 3D Printing and Robotics, R Programming, Mobile App Development, GIS Training and Consulting, Search Engine Optimization, Social Media Marketing, AutoCAD 2D and 3D, 3D Building Modelling, StaadPro Design	
	<ul> <li>Dalewares Institute of Technology, Lagos</li> </ul>	Computer Software Engineering, Computer Hardware Engineering, Networking and System security, Multimedia Technology, Computer Science, Computer Engineering, Computer Education, Microsoft Office, E-Commerce Development and Management, Data Analysis, Machine Learning With R and Python, Internet of Things, Artificial Intelligence, Big Data, Business Intelligence, DevOps, Java, Diginxt MMS Full Stack Developer, Digital Marketing, Web Development	

ses offered Ownership	eering, Computer hardware :udies, Digital multimedia, scurity	ingineering, NID Hardware king and System Security, NID ng and Media Arts. )	Cad), Data Analytics, Mysql Aicrosoft Sql Server, Oracle Jn, 2d and 3d Animation, ment, Ethical Hacking, Programing, Digital Media Networking Courses	nd Networking, Multimedia s, Programming in C, C#, on development (.NET), velopment (Java), Embedded ing in embedded systems, vare Testing using Selenium, utsiness Accounting:
	f Computer software Enginee ogy, Ogidi, Engineering, Computer stud Networking and system secu	of Basic NID Computer Software Eng D City; Engineering, NID Networkin, Multimedia, NID performing (NID - National Innovation)	Computer Aided Design (Ca Database Management, Mici Database, Graphics Design, Web Design and Developme Java Programing, Python Prc Marketing, Hardware and Ne	IT Education, Hardware and I animation, IT for Beginners, F C++, Enterprise application o Enterprise Application Devel Programming: Programming Data Structures in C, Softwar Swift iOS programming, Busi
Institutions	Buckingham Academy of Management and Technolo Anambra State,	<ul> <li>Benson Idahosa School o and Applied Studies, Benin</li> </ul>	<ul> <li>Skillstouch Ng, Abuja</li> </ul>	Aptech Computer Educat
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Skill Level	Institutions	Courses offered	Ownership
	Megatek Ict Academy	Programming(coding), Data Science, Computer Aided Design (CAD), Project Management, Building Information Modelling (BIM), Data Analysis, Software Development, Artificial Intelligence, Database Management, Mobile Apps Development, Web Development, Office Productivity, Branding/ Graphics, Cyber security, Networking/ Hardware, Digital Marketing, Machine Learning, Finance /Accounting, Oil and Gas and Microsoft Project.	
	<ul> <li>Loctech IT Training Institute, Port Harcourt</li> </ul>	Web Development - PHP and MYSQL, Microsoft Office Specialist, Python Programming Fundamentals, Full Stack Web with JavaScript and Node JS, Advanced Excel, Full Stack Web Design With Python and Django, QuickBooks Essentials for Accounting, Web Design and Development using WordPress	
	Sutchelinks Intl Company Limited	Certified Office and Desktop Packages, Website Designing and Hosting, Web Development (Php, MySql, Asp.net), Programming Languages (Php, Python, C++, Java, C#), CCTV Installation and Maintenance, Graphic Design (Corel Draw, Photoshop), Computer/ Laptop Repairs and Maintenance, Digital Marketing, Computer Networking (N+, Cisco, Server Administration, AutoCAD+ more).	
	<ul> <li>Luzoma Microsystems Limited</li> </ul>	Website Development and Hosting, Mobile App Development, Business Software Solutions, Programming and IT Training and Cloud Computing.	

Skill Level	Institutions	Courses offered	Ownership
	<ul> <li>Ace International Training Centre</li> </ul>	Certified Ethical Hacker (CEH), Certified Secure Computer User (CSCU), Certified Network Defender (CND), EC-Council Certified Incident Handler (ECIH), Certified Threat Intelligence Analyst (CTIA), EC-Council Certified Security Analyst, Certified Network Defender (CND), AutoCAD 2D, 3D, P and ID	
	Brandwone ICT Solutions	Website design, networking, cctv camera security surveillance, access control, software develop- ment and branding solutions.	
	<ul> <li>Difameg Network Nig Ltd</li> </ul>	Website Design (Hosting and Management), Sales and Supply Accessories, Networking And PC Solution, ICT/ Computer Training, Database Management, Live Video Streaming, School Management Portal and Online Examination Portal.	
	FlamyTech Computers Limited	Software Engineering, Cybersecurity/ Ethical Hacking, Java Programming, Cross-platform Mobile App Development, Android App Development, C Programming, Python Web Development, Data Analytics, C++ Programming, Python Programming, Oracle Database Management, Full Stack Web Development, Back-end Web Development, Front-end Web Development, Social Media Marketing, Computer Engineering, Computer Networking, Desktop Publishing, Data Processing, Advanced Excel, Business Computing, Computer Graphics, e-Accounting and Basic Computer Operations.	
	• CT Computer Institute	Software Programming, Web Design and Development, E-Trading and Forex Trading, Peachtree in Accounting, Advance Graphics Design, Desktop Publishing, Auto Cad 2D, 3D and Stadpro, Computer Maintenance and Repairs	

Skill Level	Institutions	Courses offered	Ownership
	• Torilo Academy	Certification in Data Analysis, Certification in Data Science, Certification in product Design(UI/UX), Web Development, Certification in Software Engineering (Python), Certification in Digital Marketing, Certification in Motion Graphics, Certification in Graphics Design, Certification in Product Management,	
	<ul> <li>Digital Micro Technologies</li> </ul>	Web Development, Android Mobile Apps, Java Software Apps, Oracle Database MGT, JavaScript Web Apps, Microsoft Office Suite, Advanced Excel Accounting, 2D Graphics design, 3D Graphics design, Computer Engineering, Desktop Publishing, Digital Marketing, Data science.	
	• CVIT Nigeria	Software Development (Java), Digital Marketing, Software Development (Python), Advance Microsoft Excel, Networking Suits, Oracle Database, Android Development, Graphics and Multimedia, Linux, Comptia Network+, Comptia Security +, Microsoft IC3, Fibre- optic Technology, Responsive Web Designing, Web Development, Security Surveillance System	
	<ul> <li>Anchorsoft Academy</li> </ul>	Full stack Web Development with Python/Django, Database Development and Administration with SOL, Software Testing and Quality Assurance with Selenium, UI/UX Graphic Design for Web and Mobile Apps, NoSOL Database Design and Development with MongoDB, Master Cloud Infrastructures Development with AWS and REST API for Mobile and Web Apps Development with Node JS.	

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Skill Level	Institutions	Courses offered	Ownership
	<ul> <li>GoldTech Computer Education</li> </ul>	ICT Fundamentals, Database Management Course, Data Science, Networking Course, Software Engineering Courses, Hardware Engineering courses, Mobile Apps Development, Web Development Courses and Graphics Design/ Animation.	
	Vsonet Education	Web Development, Mobile Apps Development, Game Development, Databases, Software Engineering, Coding and Programming (Java, Python, C#, C++, .Net, Object Oriented Programming), Network Security, Cyber Security, Ethical Hacking, Network Security, Data Science, Office Productivity( Microsoft, Word, Excel, Access and PowerPoint), Technology and IT Certification( ITIL Certification, Cisco and CompTIA A+), Graphic Design, 3D+ Animation and Marketing( Digital Marketing, Search Engine Optimization, Social Media Marketing, Content Marketing and Video + Mobile Marketing.	
	<ul> <li>Makintouch Consulting</li> </ul>	AWS, CISCO, Microsoft, ORACLE, PECB, VMWARE, CompTIA, EC-Council, ISACA, ISC_2, ITIL, Machine Learning, NETAPP, Project Management Certification, Python and Web Design and Development.	

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Skill Level	Institutions	Courses offered	Ownership
	• Digital Bridge Institute, Kano and Lagos,	Networking System Security, Computer Software Engineering, Telecommunications Technology, Multimedia Technology, Computer Hardware Engineering Technology, Visual Communication and Infographics, Cyber Forensics and IT Risk Management, Social Media Analytics and Management, Emerging Cybercrime Trends: Cyber Investigation and Mobile Forensics, Cyber security and Emerging Technologies, Electronic Banking and e-Payment Systems: Interface and Liability, Cyber Forensics and Digital Evidence Gathering, Information Systems Security for Professionals, Database Administration Fundamentals, Windows Server 2016 Administration Fundamentals, Cloud Security, Machine Learning Predictive Analysis for Business Decisions, Analysing Data with SPSS/MATLAB,	Public
	<ul> <li>Industrial Training Fund (ITF) Models Skills Training Centre, Abuja</li> </ul>	IT Essentials (Hardware and Software), Networking Fundamentals, Internetworking Technology, Java Programming, Internet Fundamentals and Applications, Server Essentials, Server Administration, Communication and Industrial Electronics, Micro Controller Technology, Networking and Communication, Electronic CAD and Practice	
Intermediate digital skills e.g., digital marketing, Social media management, Desktop publishing, Digital graphics design	CADD Centre, Lagos	Mechanical CADD, Electrical CADD, Electronic CADD, Architectural Design, Building Design, Structural Design, Land Survey and Transportation, Project Planning and Management	Private
	<ul> <li>Windave Digital Skills Academy, Abuja</li> </ul>	Digital Marketing, Web Design, Social Media Marketing, Online Advertising, Email Marketing, YouTube Monetization	

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	Digicert Tech Centre Ltd, Abuja	Ul and UX, Animation, Game Design, Graphic Design, Troopcode, Web Development, Illuctorion	
	GITNg Technology, Port Harcourt	graphic Design, web Development, musu anon Graphic Design, Microsoft Office, Cisco - CCNA, Cisco - CCNP, Web Design, IT Fundamentals, Server	
	SGL Training Institute	IT Fundamentals, Digital Marketing, 3D Animation, Web Design, Web Development, Graphics Designing and Phone Repair	
	Nova IT academy	Office IT Operations, Website Design, Advanced WordPress CMS, WordPress CMS, Desktop Publishing, Blog Development and Management, Advanced MS Excel Training, Graphics and Multimedia, Web Development, Computer Graphic Design, Data Processing, Microsoft Office Suite and Computer	
	<ul> <li>Katsina State Institute of Technology and Management Katsina,</li> </ul>	National Innovation Diploma in Networking and System National Innovation Diploma in Computer Security, National Innovation Diploma Software Engineering, National Innovation Diploma in Multimedia Technology, Web Designing, CISCO CCNA, Web Development, Virtualization Development, Introduction to Programming (Scratch/Python and Java)	Public

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Skill Level	Institutions	Courses offered	Ownership
	<ul> <li>Lagos City Computer College</li> </ul>	Professional Diploma in Digital Marketing (PDDM), Diploma in Information Technology (DIIT), National Innovation Diploma in Software Engineering (NID), Computer Service and Network Administration, National Innovation Diploma in Computer Hardware Engineering (NID), Web Technology, Web Management Information System (MIS), Management Information System (MIS), Diploma in Computer Engineering, Diploma in Social Media Marketing, Diploma in Web Development and Software Engineering	
	<ul> <li>The Industrial Skills Training Centres (ISTC) Ikeja.</li> </ul>	Basic Computer Hardware and Software Maintenance Workshop, Workshop on Digitization of Documents and Records, Workshop on Office Automation for Office Technologists (Secretaries), Workshop on Programmable Logic Control (Plc.)	
Basic digital skills e.g. Online search and infor- mation retrieval Computer applications/appreciation, Web research, online communication and other complementary skills, etc.	• The UNN Enterprise Skill Acquisition School	Matlab, Stata, Spss, Mathematica, Latex, Eviews, Microsoft Word, Microsoft Excel, Microsoft PowerPoint	Public

Implementing Institution	Location	Target Beneficia- ries	Intervention (What they're doing and how)	Experi- ences/ Challenges
Clintonel Innovation Center	Abia	Secondary school leavers and engi- neering students	Focused on building skills in Computer aided design (CAD), Computer aided manufacturing (CAM) and Renewable (Solar) energy	
TechHer Nigeria	Abuja	Women	TechHer provides a platform for technology knowledge exchange amongst women, providing real-time solutions to their tech-related problems and improving the quality of their lives and ease of doing business through a proper grasp of technology.	
Andela Nigeria	Lagos	Open to all interested in software develop- ment	Andela provides a platform to train and connect people interested in pursuing a career in software development.	
Microsoft 4Afrika	Lagos	Startups and ICT graduates	Microsoft 4Afrika is focused on developing affordable access to the Internet, digital skills and an environment that enables start-up success.	
Funding -NITDA, Microsoft Technical Support - Federal Ministry of Communication and Digital Economy	Nigeria	Youths	The aim is to up skill five million people in Nigeria over the next three years. To help reach this goal, 1,700 trainers will provide blended online and in-person training courses to the country's youth as well as government workers.	
World Bank, Equals Global Partnership, Natview technol- ogy	Kaduna	Women and girls	Natview Technology delivered trainings to vulnerable youth in conflict-affected areas to allow them to leverage employment opportunities in the digital economy. The training was delivered via remote and in-class learning.	

# Annex 2: Digital skills interventions

Implementing Institution	Location	Target Beneficia- ries	Intervention (What they're doing and how)	Experi- ences/ Challenges
Google Africa Developer Scholarship	Africa	Open to all	<ul> <li>Google and Pluralsight provide a programme to support software developers across Africa in three different roles:</li> <li>Associate Android Developer</li> <li>Associate Cloud Engineer</li> <li>Mobile Web Specialist</li> <li>The learning is online.</li> </ul>	
Ministry of Youth and Sports Development		Nigerian citizens between the ages of 18 to 35 years	This programme is designed to avail eligible Nigerian youths that will participate in standard training sessions to learn several global digi- tal roles, including Business Process Outsourcing skills, Software and Coding skills, Animation/Graphics skills and Internet of Things/IT Hardware skills. Training mode: virtual and in-person.	
Federal Ministry of Education (FG-Digital Nigeria- 2021 Free Digital and Entrepreneurial Training for Nigerians)	Nigeria	All Nigerians	Training mode is online via Digital Nigeria Training Portal	
Charis Black Projects Partners - Loose Media Limited, Savofns Limited, QikDigital, Pandora Agency, Twenties Tribe, Skyfire Digital and Kolibri Limited	Nigeria		Training mode: virtual Provided digital skills training for over 140 Nigerian youths	
British Council Digital Skills Training	Nigeria	Open to all	Training mode: online	

Implementing Institution	Location	Target Beneficia- ries	Intervention (What they're doing and how)	Experi- ences/ Challenges
Government of Nigeria and United Nations International Children's Emergency Fund (UNICEF) (Generation Unlimited (GenU) programme)	Kano, Kaduna, Lagos, Ogun, Borno, Bauchi, Ebonyi, Enugu, Niger, Benue, Rivers and Cross River	Youths from the ages of 10-30	Focuses on empowerment via three major components: Digital Skills Development, the Workforce Readiness Program and Youth Engagement/Youth Employment.	
Nigerian Government, IBM (Digital Nigeria Programme)		Youths	Provides a platform to empower Nigerian youths with digital literacy skills, to enable innovation, design and development of indigenous solutions, self-sufficiency and make Nigeria a hub for critical skills for Africa and the world at large	
African Development Bank (AfDB) (Coding for Employment programme)		Youth	Focused on training over 500 digital ambassadors to lead a peer-to-peer training model set to expand digital skills to more African youth, especially in rural communities with limited Internet connectivity. Training mode: via online plat- forms and in-person classes.	
Sigma Pensions and Junior Achievement Nigeria (Digital boot camp)	Abuja	18 - 25	Achieved this through a 5-day in-person intense Digital Bootcamp they were trained in Digital Marketing, Web Development and Graphics Design. Trained 100 youths	Resulted in a radical transforma- tion in their business and service delivery to both internal and external customers

Implementing Institution	Location	Target Beneficia- ries	Intervention (What they're doing and how)	Experi- ences/ Challenges
GIZ (Skills Development for Youth Employment - SKYE)	Nigeria	Youth between 8 - 35	The GIZ SKYE objective is to increase the prospects of gainful employment for Nigerian youth aged between 15 and 35 and for returnees in selected sectors of the econ- omy.	A total of 11,938 beneficia- ries trained out of which 4,419 are female and 2,177 beneficia- ries have gained employ- ment
Digital Skills for the Workplace (DSFW) an initiative of Tech4Dev funded by GIZ	Africa	young Africans	Focused on equipping young Africans with the top 5 employable skills globally through onsite and online learning and experiential learning through internship placements. The skills are Software Development, UI/UX Design, Product Management, Cybersecurity and Cloud Service Management	Have had 1500+ applicants and 97 per cent of the beneficia- ries gained experiential learning through internships.
Federal Ministry of Communications and Digital Economy, African Development Bank and Microsoft	Nigerian	Nigerian youth	They launched the Digital Nigeria eLearning Platform, to provide marketable digital skills to the country's youth.	
Google Digital Skills for Africa	Africa	Open to all	Anyone can learn various online courses freely through Google's online learning plat- form	
Lagos State Employment Trust Fund	Lagos	Lagosians	Created a resource based online learning platrorm to enable job creation for Residents and Businesses located in Lagos	

Implementing Institution	Location	Target Beneficia- ries	Intervention (What they're doing and how)	Experi- ences/ Challenges
National Digital States Program, Digital Kwara, Wootlab Academy	Abia, Bauchi, Bayelsa, Borno, Ekiti, Katsina, Kaduna, Imo,	Youths	The Digital States Program ensures that Nigerian youths are equipped with digital and life skills that can reduce the digital divide and foster economic growth by exposing them to digital tools and inno- vation that can redefine the future of their chosen career.	

# Annex 3: Private sector-driven initiatives

Core themes	Selected Comments
Local training providers collaborat- ing with local and foreign partners to develop training programmes for youth such as in the areas of cybersecurity and ethical hacking.	<ul> <li>A Training Centre based in Abuja partners with Microsoft International Council of E-Commerce Consultants, also known as EC-Council which is the main core for ethical Hackers and information security.</li> <li>The Centre partners with the CADD Centres to fill gaps in the use of AutoCAD - an engineering application for drawing and design. The Centre also collaborates with the Nigerian Army to train some of their officers.</li> </ul>
Employers have relationship with digital skills training institutions to source staff.	• A representative of a training institution with global presence stated "now we have partnerships with companies like Julius Berger, the Transmission Company of Nigeria (TCN), as well as the Media such as Cool FM. We have partners that come to us whenever they need to recruit people. And they tell us that we can go to our list of trainees and get the people that we think we have trained and are competent enough. They ask us to conduct an interview with them and send them the best three to select from. The Abuja School of Postgraduate Studies is a case in point. They needed an ICT person, so they approached us, asking us to conduct an interview and send them the best five out of those interviewed".
Working relationships with the industry, such as the development and deploy- ment of application software, create opportunities for collaboration between the industry and training institutions, especially in the area of technical skill transfer to employees of the private sector.	<ul> <li>An I.T training firm in Port Harcourt which is also into software development informed us that they have collaboration with about 7-8 firms with 2-3 of these firms in oil servicing sector. The training institution develops enterprise resource planning (ERP) software for these clients and sometimes performs maintenance on applications while concurrently providing other backstopping services through its trained personnel sent to support their operations from time to time. Thus, through this working relationship, training institutions work with both small and large businesses to provide placement services for the present and past trainees.</li> <li>The recruitment firms undertake placement services on behalf of the training institutions from time to time. According to a training institution in Lagos: "we currently collaborate with a few private recruitment organizations that provide outsourcing services for big and small companies; we are also in the process of supporting a national skill acquisition programme with the office of the presidency, to upskill students from Junior Secondary School and above. The programme is divided into two phases - in-school and out-school. The out school will cater for those who have graduated and are having some efficiency in skills." As part of the upskilling process, partner training institutions are to perform dual roles: 1) to train and 2) to deploy on the job.</li> <li>A training institution in Abuja noted: "We have had collaborations with organizations such as the Economic Community for West Africa States (ECOWAS), Canadian Embassy, and others which resulted in training their staff in specific areas needed to improve their productivity at work. We have also partnered with GIZ in capacity building for employability. Partnering with GIZ, we have trained over 400 people across different programmes like Python Programming, Cyber Security, Web Design and Development, Graphic Design, and Oracle Database."</li> </ul>

Core themes	Selected Comments
Selected Innovation Enterprise Institution (IEI) work collaboratively with govern- ment to build digital skills for youth	• The NSM awards a National Innovation Diploma in software and hardware engineering as well as web design, basic coding and networking through short courses. Currently, it works collaboratively with the FCT Science and Technology Department under the FCT Education Secretariat to fill digital skill gaps in the education sector. It has an alliance (or accreditation and approval to run programmes) with the National Business and Technical Examination Board (NABTEB). According to the NSM team, they have gone into trying to build those kinds of government alliances because "whatever you do if you don't have that alliance with the government you will run into problems in the future". Thus, the NSM has some collaboration with the National Institute for Educational Planning and Administration (NIEPA). NIEPA serves as an enabler. Similar to the NSM relation- ship with NABTEB, NSM creates a programme jointly with these institutions and hand over such programmes to them (government). Thus, with this collaboration, NSM uses the established framework of these institutions to expand train- ing nationally.
# Annex 4: Stakeholders interviewed

S/N	Organization
1	Digital Bridge Institute
2	Federal Ministry of Labour
3	Ministry of Communication and Digital Economy
4	GIZ
5	NECA
6	Bizmarrow Technologies Ltd
7	Early Code
8	Loctech IT Training Institute
9	New Horizons Nigeria
10	Nspire School of Management and Technology
11	Oratheresa Web Development And Training Ltd
12	Parach Computers
13	Torbita Limited
14	The Training Centre
15	ACE International Centre
16	AfriHub Technologies
17	Generation Connect

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