

A Global Skill Partnership in Information, Communications, and Technology (ICT) between Nigeria and Europe

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INTRODUCTION

The World Bank is partnering with the government of Nigeria to better understand how labor migration and skills partnerships can provide more and better jobs to Nigerian youth. One objective of this collaboration is to assess the feasibility of new bilateral labor agreements in chosen sectors, mirroring the Center for Global Development's (CGD) Global Skill Partnership model.

A joint CGD-World Bank report—"Expanding Legal Migration Pathways from Nigeria to Europe: From Brain Drain to Brain Gain"¹—and a related brief² present the results of this work. The report outlines both the opportunity inherent in the growing (yet unemployed) youth population in Nigeria and the declining working-age population in Europe that is leading to widespread skill shortages. It then describes the Global Skill Partnership model and applies it to case studies in three sectors: nursing; construction; and this one, on information, communication, and technology (ICT).

The digital economy, of which the information, communications, and technology (ICT) industry is a part, is worth 15.5 percent of global GDP. Yet the sector is vast and hard to define, with roles spanning the spectrum of mid- to high-skilled, and present within a variety of industries. Many of these roles are vacant, with skill shortages harming firms in Nigeria as well as countries throughout Europe. This case study outlines a Global Skill Partnership between Nigeria and a number of European countries including Germany, the UK, Belgium, and Lithuania within ICT. It includes an overview of the training and migration landscape in all countries, the specific design of such a partnership, and risks and mitigation measures.

DEVELOPING AN ICT MIGRATION PARTNERSHIP

The OECD refers to ICT as the "manufacturing and services industries whose products primarily fulfil or enable the function of information processing and communication by electronic means, including transmission and display."³ As a result of this definition, the industry includes companies that make and distribute such technology, as well as roles within the companies which use this technology. It therefore encompasses both the creation of *ICT assets* (e.g. computer hardware, software, infrastructure) and *ICT services* (e.g. research and development, analysis, programming). Both make up part of the much broader "digital economy," a powerful engine for economic growth and job creation around the world.

The digital economy is huge and growing rapidly. Researchers from Huawei and Oxford Economics found that it is "worth \$11.5 trillion globally, equivalent to 15.5 percent of global GDP, and has grown two and a half times faster than global GDP over the past 15 years."⁴ The ICT industry stands at the center of this and has been a powerful driver of economic growth in low-, middle-, and high-income

¹ Samik Adhikari, Michael Clemens, Helen Dempster, and Nkechi Linda Ekeator. 2021. "Expanding Legal Migration Pathways from Nigeria to Europe: From Brain Drain to Brain Gain." Washington, DC: Center for Global Development (CGD) and World Bank. <https://www.cgdev.org/publication/expanding-legal-migration-pathways-nigeria-europe-brain-drain-brain-gain>.

² Samik Adhikari, Michael Clemens, Helen Dempster, and Nkechi Linda Ekeator. 2021. "Why Europe Should Build Legal Migration Pathways with Nigeria." Washington, DC: Center for Global Development (CGD) and World Bank. <https://www.cgdev.org/publication/why-europe-should-build-legal-migration-pathways-nigeria>.

³ Organisation for Economic Cooperation and Development (OECD). "Information and communication technology (ICT)." https://www.oecd-ilibrary.org/science-and-technology/information-and-communication-technology-ict/indicator-group/english_04df17c2-en

⁴ Makada Henry-Nickie, Kwadwo Frimpong, and Hao Sun. 2019. "Trends in the Information Technology Sector." Washington, DC: Brookings. <https://www.brookings.edu/research/trends-in-the-information-technology-sector>

countries around the world.⁵ Unsurprisingly, the industry has been fairly resilient to the impact of COVID-19 and global lockdowns.⁶ The move to digital working and learning has accelerated take-up of ICT services and the skills that come with that. New technologies have been created at rapid speed and the world has become more connected than ever before.⁷

Given the disparate nature of the ICT industry, it is unsurprising that roles within the industry also vary considerably. The European Centre for the Development of Vocational Training (CEDEFOP) notes that most roles within Europe's ICT industry are highly skilled—in 2015, 7 out of 10 people held high qualifications, and about one-quarter held medium-level qualifications.⁸ In addition to hard skills in programming languages, data analysis, and data security, ICT professionals also need a range of soft skills including problem solving and flexibility. While some within the industry work in roles that are both long-term and permanent, others operate on a contract basis. This is especially the case within emerging economies such as Nigeria, where many firms are small and hire staff on a contract basis.⁹

The ICT industry is growing rapidly and so too is the demand for talent. From 2005 to 2015, employment for ICT professionals in the EU grew by one-third, and a further 10 percent growth is expected by 2025.¹⁰ In addition, the current workforce is aging and local training and development is not keeping pace with demand.¹¹ As a result, the ICT industry is a shortage occupation in 24 EU Member States (Figure 1). Similar trends can be seen across low- and middle-income countries. As will be explored further below, Nigeria is said to be Africa's biggest digital market and the digital economy could add \$88 billion and 3 million jobs to the economy by 2027.¹² Yet employers say job readiness among young people is low and the training and education sector has not been able to keep up with the changing demands of employers.¹³

Two potential factors may reduce the demand for ICT workers within both countries of origin and destination. First, automation. The digital economy, by its very nature, is constantly attempting to improve productivity by introducing robots, AI, and other time-saving technologies into the workforce.¹⁴ Whether this will displace the need for manual workers is uncertain. Second, COVID-19.

⁵ Thomas Niebel. 2018. "ICT and economic growth—Comparing developing, emerging and developed countries." *World Development* 104, 197-211. April 2018. <https://doi.org/10.1016/j.worlddev.2017.11.024>

⁶ OC&C. 2020. "ICT Services: Financial impacts on a "critical enabler" in a Covid-19 world." <https://www.ocstrategy.com/media/2678/ict-and-digital-services-covid19-impacts.pdf>

⁷ Parul Oberoi and Neha Singh. 2020. "COVID-19: Consequences and opportunities for the ICT sector." *Fractal*. <https://fractal.ai/covid-19-consequences-opportunities-for-ict/>

⁸ Cedefop. 2016. "ICT professionals: skills opportunities and challenges (2016)." https://skillspanorama.cedefop.europa.eu/en/analytical_highlights/ict-professionals-skills-opportunities-and-challenges-2016

⁹ Vijaya Ramachandran, Jennifer Obado-Joel, Razaq Fatai, Junaid Sadiq Masood, and Blessing Omakwu. 2019. "The New Economy of Africa: Opportunities for Nigeria's Emerging Technology Sector." Washington, DC: Center for Global Development (CGD). <https://www.cgdev.org/reader/new-economy-africa-opportunities-nigerias-emerging-technology-sector>

¹⁰ Cedefop. 2016. "ICT professionals: skills opportunities and challenges (2016)." https://skillspanorama.cedefop.europa.eu/en/analytical_highlights/ict-professionals-skills-opportunities-and-challenges-2016

¹¹ Liberty Global. 2014. "What kind of jobs are there in the ICT Industry?" *All Digital*. March 27, 2014. <https://all-digital.org/kind-jobs-ict-industry/>

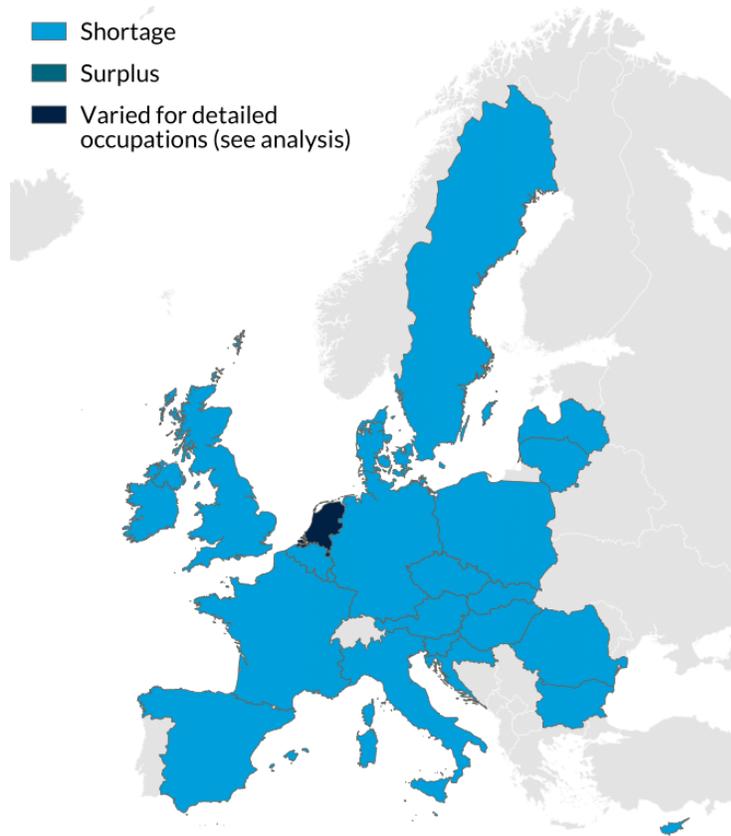
¹² Jobberman. 2020. "The Digital Sector Skills Gap Report 2020." <https://www.jobberman.com/research>

¹³ Vijaya Ramachandran, Jennifer Obado-Joel, Razaq Fatai, Junaid Sadiq Masood, and Blessing Omakwu. 2019. "The New Economy of Africa: Opportunities for Nigeria's Emerging Technology Sector." Washington, DC: Center for Global Development (CGD). <https://www.cgdev.org/reader/new-economy-africa-opportunities-nigerias-emerging-technology-sector>

¹⁴ Makada Henry-Nickie, Kwadwo Frimpong, and Hao Sun. 2019. "Trends in the Information Technology Sector." Washington, DC: Brookings. <https://www.brookings.edu/research/trends-in-the-information-technology-sector>

Whether the shock will lead to more offshoring is unclear—will it provide more opportunities within countries of destination,¹⁵ or will companies increasingly look closer to home?¹⁶

Figure 1. ICT professionals are needed in 24 EU Member States



Source: Cedefop. 2016. “ICT professionals: skills opportunities and challenges (2016).” https://skillspanorama.cedefop.europa.eu/en/analytical_highlights/ict-professionals-skills-opportunities-and-challenges-2016

ICT Worker Migration

Given the sizeable skills shortages present within the ICT industry, and the rapidly changing nature of employer demand, countries have long sought to use foreign workers within key roles. For roles that can be done remotely, employers have used both offshoring (relocating or subcontracting work abroad) and outsourcing (expanding company operations into foreign companies) to make use of foreign labor pools.¹⁷ But even within the digital economy, there are some roles that must be done (or are better done) onsite. To facilitate this, employers have used three main strategies: (i) Recruiting

¹⁵ Dylan Matthews. 2020. “Covid-19 taught companies how to run remote offices. That could transform developing countries.” Vox. September 21, 2020. <https://www.vox.com/future-perfect/21445830/work-from-home-covid-19-offshoring>

¹⁶ Ryan Carter. 2020. “Is COVID-19 Upending Offshore Outsourcing?” Traders Magazine. November 17, 2020. <https://www.tradersmagazine.com/am/is-covid-19-upending-offshore-outsourcing/>

¹⁷ Philip Schörpf and Ursula Holtgrewe. 2016. “Understanding the impact of outsourcing in the ICT sector to strengthen the capacity of workers’ organizations to address labor market changes and to improve social dialogue.” Vienna: FORBA. https://www.researchgate.net/publication/321749121_Understanding_the_impact_of_outsourcing_in_the_ict_sector_to_strengthen_the_capacity_of_workers_organisations_to_address_labour_market_changes_and_to_improve_social_dialogue

foreign workers from abroad; (ii) recruiting immigrants already in the country of destination; and (iii) transferring individuals employed by multinational companies between offices.¹⁸

The skill shortages present within the industry today have seen employers and their countries increasingly attempt to employ the first strategy, by liberalizing visa schemes and implementing pilot projects. To date, these interventions have largely focused on attracting already qualified talent from foreign countries, usually at high-skill levels. For example, the EU's Blue Card Directive aims to attract highly qualified workers from third countries to apply for roles within the EU and in return, receive a work permit of one to four years.¹⁹ Such legal labor immigration pathways have facilitated the movement of foreign workers to the EU to work in the ICT industry, especially those from India.²⁰

BOX 1. IOM BELGIUM AND LUXEMBOURG'S, ENHANCING TUNISIAN YOUTH EMPLOYABILITY THROUGH PROFESSIONAL INTERNSHIPS IN BELGIAN COMPANIES

Between March 2018 and August 2019, IOM Belgium and Luxembourg implemented a project in partnership with the Government of Belgium, the Government of Tunisia, and various public and private employment agencies. The project 'Enhancing Tunisian youth employability through professional internships in Belgian companies', aimed to reduce pressure on the Tunisian labor market by offering 31 graduates the opportunity to work in Belgium for six months through apprenticeships and internships across 12 different Belgian companies.²¹ Upon return to Tunisia, participants were supported in job-seeking for five months and received additional training to enhance their skills.²²

Analysis of the impact of the program by the Center for European Policy Studies (CEPS) has found that all participants, except for two who wanted to continue their studies, managed to find a job by the end of the project. Half had already done so during their Belgian internship. Eighty-nine percent of these found roles in Tunisia, 7 percent in Belgium, and 4 percent in Germany. Importantly, 26 percent were hired by the company that hosted their internship, specifically by those organizations' subsidiaries in Tunisia. Both participants and employers were, on average, satisfied with the program, though employers highlighted the delays before participants were able to start work. Before the program, seven of the companies had never hired internationally before. Now, they are interested in collaborating further and even in extending business operations to Tunisia.²³

Source: Mattia Di Salvo and Nelson Mallè Ndoeye. 2020. "Paving the way for future labour migration: A Belgian-Tunisian Skills Mobility Partnership." Brussels: Center for European Policy Studies (CEPS). <https://www.ceps.eu/ceps-publications/paving-the-way-for-future-labour-migration/>

¹⁸ International Labour Organization (ILO). 2020. "Skills shortages and labour migration in the field of information and communication technology in Canada, China, Germany and Singapore." Geneva: International Labour Organization (ILO). https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_755663.pdf

¹⁹ European Parliament. 2015. "The EU Blue Card Directive." https://www.europarl.europa.eu/RegData/etudes/BRIE/2015/558766/EPRS_BRI%282015%29558766_EN.pdf

²⁰ Divya Satija and Arpita Mukherjee. 2013. "Movement of ICT Professionals between India and the EU: Issues and the Way Forward." CARIM-India Research Report 2013/14. New Delhi: CARIM-India. <https://core.ac.uk/download/pdf/45683683.pdf>

²¹ International Organization for Migration (IOM). 2018. "Project Information Sheet: Enhancing Tunisian youth employability through professional internships in Belgian companies." Brussels: International Organization for Migration (IOM). https://belgium.iom.int/sites/default/files/Gallery/Factsheet%20Enhancing%20Tunisian%20Youth%20Employability_EN.pdf

²² Mattia Di Salvo and Nelson Mallè Ndoeye. 2020. "Paving the way for future labour migration: A Belgian-Tunisian Skills Mobility Partnership." Brussels: Center for European Policy Studies (CEPS). <https://www.ceps.eu/ceps-publications/paving-the-way-for-future-labour-migration/>

²³ Mattia Di Salvo and Nelson Mallè Ndoeye. 2020. "Paving the way for future labour migration: A Belgian-Tunisian Skills Mobility Partnership." Brussels: Center for European Policy Studies (CEPS). <https://www.ceps.eu/ceps-publications/paving-the-way-for-future-labour-migration/>

Promoting a Genuine Development Benefit

Promoting labor migration within the ICT field has pros and cons. As PALIM has found, the ICT sector may be more politically palatable than, say, health care, which comes with a host of greater ethical considerations. The language requirements are usually lower, especially if workers are operating within programming languages or other forms of software development. Companies may be more interested in collaborating due to the booming nature of ICT markets within low- and middle-income countries, especially given the future potential for offshoring and investment. It was expressed during our interviews that the ICT sector is considered by many to be “low-hanging fruit,” a way to test the potential of such pathways and prove their impact, before moving on to more challenging sectors like construction and health care. On the other hand, it is a difficult sector to work within for three main reasons.

The changing nature of private sector demand. The specific skillsets required change quickly as the digital economy moves on. What is in demand now, may not be in demand two years from now when workers are trained.²⁴ Partnerships therefore need to be incredibly flexible to respond to this.

The nature of ICT work itself. Especially in countries of origin, ICT work is often short-term or done on a consultancy basis. Therefore, any training in hard skills may need to go alongside additional support for business investment and/or entrepreneurship. This will help develop the employment prospects of both those who prefer longer-term projects, and those who want to work on a short-term basis.

The nature of training for ICT skills. Even in a country like Nigeria, with its booming ICT sector, the formal training system is essentially nonexistent. While there are ad hoc training programs, many learn online in a fragmented way, and are not necessarily taught the skills that are in need within ICT companies either at home or abroad. Investing in ICT training will therefore likely require starting from the ground up with the concurrent requirements in terms of resource.

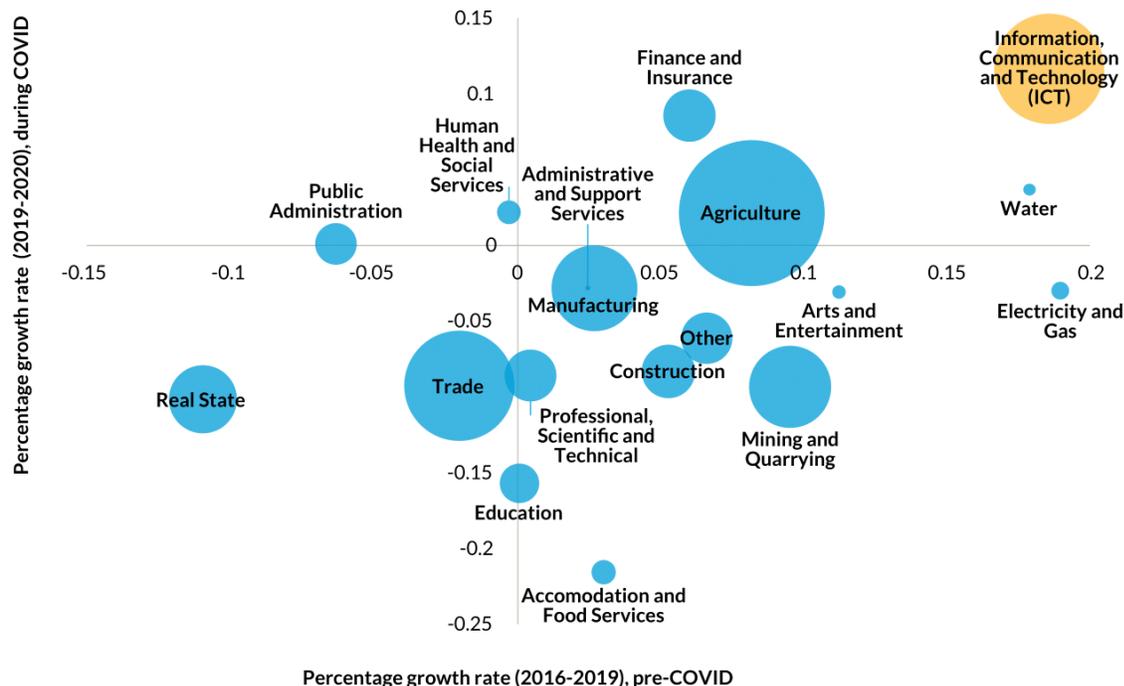
ICT IN NIGERIA

The ICT sector contributed to 15 percent of Nigeria’s GDP in 2020, behind only the agriculture sector which contributed 20 percent.²⁵ It is also one of the fastest growing sectors in Nigeria. Figure 2 shows the pre-COVID-19 (2016-2019) and during COVID-19 (2019-2020) growth rates of different sectors contributing to Nigeria’s GDP. The ICT sector grew at 18 percent between 2016 and 2019 and continued to grow at 12 percent during 2020, emerging as one of the sectors that did not suffer as a result of the pandemic.

²⁴ Helen Dempster and Michael Clemens. 2020. “The EU Migration Pact: Putting Talent Partnerships into Practice.” Center for Global Development (CGD) Blog. November 19, 2020. <https://www.cgdev.org/blog/eu-migration-pact-putting-talent-partnerships-practice>

²⁵ National Bureau of Statistics. 2020. “Nigeria Gross Domestic Product Report (Q4 and Full Year 2020).” <https://nigerianstat.gov.ng/download/1229>

Figure 2. The GDP growth in Nigeria’s ICT sector continued despite of COVID-19



Source: World Bank Calculations using data from the National Bureau of Statistics (NBS)

The continued growth in Nigeria’s ICT sector demonstrates the strides made by Nigeria in establishing essential ICT related infrastructure. Overall, Nigeria has a vibrant ICT sector made up of both large and small firms delivering cross-cutting services in health care, agriculture, finance, e-commerce and retail. The sector has 90 tech hubs which is the most in Africa followed by South Africa’s 78 and Egypt’s 56.²⁶ The sector is also the biggest technology market on the continent.²⁷ As the ICT sector is deeply integrated with other key sectors, it contributed 17.8 percent to Nigeria’s GDP during the second quarter of 2020.²⁸

In 2019, Nigeria adopted a National Digital Economy Policy and Strategy 2020-30. One of the eight pillars of the strategy focuses on digital literacy and skills with the aim of creating a pool of Nigerians with globally recognized and certified digital skills.²⁹ In the last few years, however, the ICT sector, like many other sectors, has faced several challenges due to macroeconomic slowdown and currency depreciation as a result of the 2015-16 recession.

²⁶ Toby Shapshak. 2019. “Africa Now Has 643 Tech Hubs Which Play “Pivotal” Role For Business.” Forbes. October 30, 2019. <https://www.forbes.com/sites/tobyshapshak/2019/10/30/africa-now-has-643-tech-hubs-which-play-pivotal-role-for-business/?sh=694cceda4e15>

²⁷ Vijaya Ramachandran, Jennifer Obado-Joel, Razaq Fatai, Junaid Sadiq Masood, and Blessing Omakwu. 2019. “The New Economy of Africa: Opportunities for Nigeria’s Emerging Technology Sector.” Washington, DC: Center for Global Development (CGD). <https://www.cgdev.org/reader/new-economy-africa-opportunities-nigerias-emerging-technology-sector>

²⁸ National Bureau of Statistics. 2020. “Nigerian Gross Domestic Product Report (Q2 2020).” https://www.nigerianstat.gov.ng/pdfuploads/GDP_Report_Q2_2020.pdf

²⁹ Federal Ministry of Communications and Digital Economy. 2019. “National Digital Economy Policy and Strategy (2020-2030).” Abuja: Federal Ministry of Communications and Digital Economy. <https://www.ncc.gov.ng/docman-main/industry-statistics/policies-reports/883-national-digital-economy-policy-and-strategy/file>

The Workforce

The ICT sector has been earmarked as having considerable potential to provide employment and entrepreneurial opportunities for the growing number of youths in the country. Despite this, the ICT sector growth has not translated into jobs. Despite the presence of some of the biggest global tech companies such as IBM, Microsoft, Google, and CISCO, the sector employed only one percent (497,000 persons) of the country's population as of 2017.³⁰ Unemployed youth find it difficult to benefit from the opportunities in the sector due to technical and soft skills gaps. In terms of digital skills development, Nigeria ranks 122nd out of 140 countries.³¹

Nigeria's ICT sector is regulated by government and nongovernment stakeholders and associations led by the Computer Professionals Registration Council of Nigeria (CPN). The CPN registers all qualified ICT professionals and practitioners and conducts assessment and licensing of private academies. Examples of ICT professionals/ CPN members are graduates of Computer Science/Engineering, Information and Communication Engineering and the like. Additionally, there are 74 broad practice areas mentioned in the CPN's Regulation for ICT Service 2017 including identity management services, maintenance of computer hardware and software, system integration services, internet service provision, network security, web hosting, and so on.³² Graduates of non-ICT fields can become CPN members by taking CPN's professional examinations.³³ There are other ICT-related professional bodies which are also regulated by CPN.³⁴ The stakeholders and government agencies collaborate in the regulation and maintenance of the professional content of ICT syllabi.

ICT Management and Training

The training ecosystem consists of both formal and informal providers. Formal training is provided by universities and other higher educational institutions, at workplaces, and through traineeship programs. The curriculum design and accreditation are jointly done by CPN and the National Universities Commission (NUC), the National Commission for Colleges of Education (NCCE), and the National Board for Technical Education (NBTE) for respective formal training institutions. Training effectiveness is, however, hampered by outdated curriculum, poor infrastructure, mismatch between curriculum and the market needs. And this shows in the quality of graduates most of whom reportedly lack skills in artificial intelligence, machine learning, data science, big data analytics, cloud infrastructure, etc.³⁵ Some employers offer in-service training to fill the skills gaps but the high turnover in the sector means that many of the trained workers move to employers that offer higher pay, providing little incentive for the employers to sponsor training.

Informal training is accessible via both online and offline platforms including computer repair shops, peer learning groups, and training and certification platforms such as Coursera and edX. The offline

³⁰ United Nations Conference on Trade and Development (UNCTAD). 2019. "Digital Economy Report 2019. Value Creation and Capture: Implications for Developing Countries." New York: United Nations Conference on Trade and Development (UNCTAD). https://unctad.org/system/files/official-document/der2019_en.pdf

³¹ Klaus Schwab. 2019. "The Global Competitiveness Report 2019." Geneva: The World Economic Forum (WEF). http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport2019.pdf

³² Nigerian Federal Government. 2017. "Service Constituting Practice of Computing under the Computer Professionals Registration Council of Nigeria Act." May 8, 2017. https://www.cpn.gov.ng/download/NEW_REGULATIONS_ON_ICT_SERVICES.pdf

³³ Computer Professionals (Registration Council of) Nigeria (CPN). "Examinations." <https://www.cpn.gov.ng/metro/?ref=metro/content&list=cd/3>

³⁴ Nigeria Computer Society (NCS); Information Technology Association of Nigeria (ICTAN); The Institute of Software Practitioners of Nigeria (ISPON); and The Nigerian Association of Computer Science Students (NACOSS).

³⁵ Jobberman. 2020. "The Digital Sector Skills Gap Report 2020." <https://www.jobberman.com/research>

training and certification platforms are noted for their ineffectiveness while learners who engage in peer learning and online personal training are noted to excel at work.³⁶ Sector stakeholders believe that most Nigerian software developers are self-learners who have taught themselves through online platforms which results in specific skills shortages required in the job market. As a result, some corporate entities have begun to domesticate ICT training in Nigeria. For example, the Microsoft Foundation is training 450 software developers, while Jobberman is collaborating with Mastercard Foundation to train one million youth in soft skills such as emotional intelligence, innovativeness, problem solving, lifelong learning, growth mindset, leadership/courage and intellectual humility.

Migration

Unfortunately, there is no good data regarding the presence of Nigerian ICT professionals abroad. Certainly, key countries of destination for Nigerian migrants see large numbers of foreign personnel working within their ICT sectors. Over the past three decades, the global migration of ICT specialists has been on the rise and began with the migration of Indian ICT specialists to the United States.³⁷ Globally, migrant ICT professionals contribute substantially to innovation in destination countries. But they can also contribute through technology and skill transfers to countries of origin such as Nigeria. For example, in 2012, two Harvard Business School graduates from Nigeria cofounded Jumia, a Nigerian e-commerce site and one of the first tech start-ups in the country. Since then tech firms have been established in the fields of energy, agriculture, banking, transportation, logistics, health, and finance.³⁸

Sector stakeholders in Nigeria support legal migration, especially for skills enhancement. Temporary migration for purposes such as exchange programs or value-maximizing labor is encouraged. While the narrative persists of net human capital loss in the ICT sector due to skilled youth who migrate to find better job opportunities abroad³⁹, what is seldom discussed is the role that these youth play to support technology transfers back to Nigeria, or in the human capital accumulation of prospective ICT professionals.

POTENTIAL DESTINATION MARKETS

The ICT sector is growing rapidly. It stands at the heart of the digital economy, which has grown two and a half times faster than global GDP over the past 15 years.⁴⁰ COVID-19 has accelerated the uptake of digital technologies, and the ICT sector is expected to be one of the few to not suffer hugely from the pandemic. About one-quarter of the roles within the ICT sector in Europe are mid-skill roles such as programming, data analysis, and data security. And these roles are available in large supply. From 2005 to 2015, employment for ICT professionals grew by one-third and it is expected to grow by a

³⁶ Qualitative information based on interviews with sector stakeholders.

³⁷ International Labour Organization (ILO). 2019. "Skills shortages and labour migration in the field of information and communication technology in India, Indonesia and Thailand." Geneva: International Labour Organization (ILO). https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_710031.pdf

³⁸ Vijaya Ramachandran, Jennifer Obado-Joel, Razaq Fatai, Junaid Sadiq Masood, and Blessing Omakwu. 2019. "The New Economy of Africa: Opportunities for Nigeria's Emerging Technology Sector." Washington, DC: Center for Global Development (CGD). <https://www.cgdev.org/reader/new-economy-africa-opportunities-nigerias-emerging-technology-sector>

³⁹ Yomi Kazeem. 2018. "Nigeria's tech ecosystem is struggling to keep hold of its best software engineers." *Quartz Africa*. December 17, 2018. <https://qz.com/africa/1491951/nigeria-tech-developers-move-to-europe-us-canada/>

⁴⁰ Makada Henry-Nickie, Kwadwo Frimpong, and Hao Sun. 2019. "Trends in the Information Technology Sector." Washington, DC: Brookings. <https://www.brookings.edu/research/trends-in-the-information-technology-sector>

further 10 percent by 2025.⁴¹ Given this sizeable demand, it is unsurprising that many European countries have chosen ICT as the sector they wish to focus on when developing mobility partnerships. This section outlines how such a project would be implemented with Germany, the UK, Belgium, or Lithuania, as well as outlining some challenges common to all.

Germany

In 2017, ICT contributed 4.2 percent to the German GDP; just under five percent of people are employed in the sector overall.⁴² Most workers within the sector obtain vocational qualifications and end up being both more highly educated and more highly paid than the average German worker. Yet the training of new ICT workers is not keeping pace with demand. In 2019, more than 100,000 positions within the sector remained vacant.⁴³ Specialists within software development, application support, ICT security, and data science were particularly needed. CEDEFOP estimates that by 2030, Germany will need 138,000 additional ICT professionals, 40 percent of whom will be computer programmers.⁴⁴

To facilitate the migration of skilled ICT professionals, the new Skilled Immigration Act includes a special provision for ICT specialists. They are able to take up employment in Germany even without a formal qualification. All that is required is three years' experience, a monthly income of at least €4,020, and a conciliation agreement with BMAS.⁴⁵ The Federal Employment Agency (BA) has established the Zentrale Auslandsund Fachvermittlung (ZAV) (Central International Intermediation Service) which provides counselling and job placement services to skilled migrants, including ICT professionals.

BOX 2. MAKE-IT IN AFRICA

The move to a more digital-based economy provides vast opportunities for emerging markets to meet the SDGs. Here, technological entrepreneurship is key as it enables entrepreneurs to modernize their country's economy and society, identify innovation solutions, and create new opportunities and jobs. Yet as this report has shown, in countries like Nigeria, it is difficult for tech entrepreneurs to create, sustain, and grow their businesses.

Between 2017 and 2019, GIZ and the German Federal Ministry for Economic Cooperation and Development (BMZ) implemented a new project called Make-IT in Africa whereby they invested in building business ecosystems in Ghana, Kenya, Nigeria, Rwanda, and Tunisia. The aim was to support 50 tech start-ups in two pilot countries, Nigeria and Kenya, to facilitate improvements in sustainable and inclusive development.

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. "Make-IT in Africa." <https://www.giz.de/en/worldwide/57293.html>

⁴¹ Cedefop. 2016. "ICT professionals: skills opportunities and challenges (2016)." https://skillspanorama.cedefop.europa.eu/en/analytical_highlights/ict-professionals-skills-opportunities-and-challenges-2016

⁴² International Labour Organization (ILO). "Skills shortages and labour migration in the field of information and communication technology in Canada, China, Germany and Singapore." Geneva: International Labour Organization (ILO). https://www.ilo.org/global/docs/WCMS_755663/lang--en/index.htm

⁴³ Make it in Germany. "Working, studying, living in Germany." <https://www.make-it-in-germany.com/en/jobs/professions-in-demand/scientists-it>

⁴⁴ Cedefop. "Skills Forecast." <https://www.cedefop.europa.eu/en/publications-and-resources/data-visualisations/skills-forecast>

⁴⁵ International Labour Organization (ILO). "Skills shortages and labour migration in the field of information and communication technology in Canada, China, Germany and Singapore." Geneva: International Labour Organization (ILO). https://www.ilo.org/global/docs/WCMS_755663/lang--en/index.htm

UK

In 2016, the UK ICT sector contributed \$160 billion to the UK economy, increasing by over 20 percent from 2011. It spends more per head on ICT than any other country barring the US.⁴⁶ There were 950,000 people employed in ICT and telecommunications in the UK in 2016, 3 percent of the working population, with an 82 percent to 18 percent male to female split.⁴⁷ The majority of these fall within the professionals category with others employed as researchers, sales, and in managerial roles. In 2018, the Open University Business Barometer estimated that there are 600,000 vacancies within the sector, and that this is costing the country “£6.3 billion per year in recruitment fees, inflated salaries, temporary staff, and training for workers hired at a lower level than intended.”⁴⁸ Of the 950 businesses surveyed, 91 percent struggled to find workers with the right skills, and most felt the situation was going to get worse. The number of students taking ICT and computing secondary qualifications has fallen, and as a result, it is expected there will be one million tech vacancies in a few years’ time.⁴⁹

In January 2021, as a result of Brexit, the UK instituted a new Points-Based Immigration System. This system includes a Skilled Worker route, whereby someone will be able to access a visa if they have a job offer at a specific skill level, a good level of English, and a minimum salary of £25,600. This requirement is reduced to £20,480 if they have a job offer within a specific shortage occupation.⁵⁰ Included on this shortage list are ICT business analysts, architects, and systems designers as well as programmers and software development professionals, web design and development professionals, and cyber security specialists (among other roles).⁵¹ This visa lasts five years and can be extended.

Belgium

Belgium’s ICT sector is flourishing. “It currently contributes over 4 percent of Belgium’s gross domestic product, and between 1997 and 2007 it accounted for a sixth of the country’s growth.”⁵² While digitization impacts the entire labor force, there are substantial (and growing) labor shortages within the ICT sector. By 2030, there will be 584,000 unfilled vacancies which will mean the country misses out on €60 billion of GDP.⁵³ These vacancies occur due to both a growing need within the sector as well as a low number of graduates. While ICT workers are needed across Belgium, shortages are most acute in Flanders and Wallonia, with the lowest shortages in Brussels.

⁴⁶ International Trade Administration. 2019. “United Kingdom Information Communication Technology (ICT).” Last published October 13, 2019. <https://www.trade.gov/knowledge-product/united-kingdom-information-communication-technology-ict>

⁴⁷ Office for National Statistics (ONS). 2017. “Are we training enough people to become programmers?” Published June 19, 2017. <https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/articles/arewetRAININGenoughpeopletobecomeprogrammers/2017-06-19>

⁴⁸ Edge Foundation. 2018. “Skills shortages in the UK economy.” Bulletin 2. Published July 2018. <https://www.edge.co.uk/research/projects/skills-shortages-uk-economy/skills-shortage-bulletin-2/>

⁴⁹ Neil Franklin. 2018. “Shortage of tech skills and 600,000 job vacancies costing UK economy £63 billion a year.” Insight. August 1, 2018. <https://workplaceinsight.net/shortage-of-tech-skills-and-600000-job-vacancies-costing-uk-economy-63-billion-a-year/>

⁵⁰ UK Visas and Immigration. 2021. “An introduction for employers (accessible version).” Updated January 4, 2021. <https://www.gov.uk/government/publications/uk-points-based-immigration-system-employer-information/the-uks-points-based-immigration-system-an-introduction-for-employers>

⁵¹ UK Visas and Immigration. 2020. “Skilled Worker visa: shortage occupations.” Published December 1, 2020. <https://www.gov.uk/government/publications/skilled-worker-visa-shortage-occupations>

⁵² Business.Belgium.Be. “ICT sector.” https://business.belgium.be/en/investing_in_belgium/key_sectors/ict

⁵³ AGORIA. 2018. “La digitalisation et le marché du travail belge.” September 2018. Brussels: AGORIA. https://www.acdn.be/_projects/bethechange/brochures/brochure_FR_V08.pdf

BOX 3. EUROPEAN PILOT PROJECT LINKING MOROCCAN ICT DEVELOPMENT AND LABOUR SHORTAGES IN FLANDERS (PALIM)

In late 2018, the Belgium development agency, Enabel, approached the EU's Mobility Partnership Facility (MPF) for funding to support a new pilot project. The pilot project was to be modelled on the Global Skill Partnership concept and would train young Moroccans in ICT skills that were in need by employers in both Morocco and the Belgium region of Flanders. The project brought together Enabel and the Flemish and Moroccan employment agencies (VDAB and ANAPEC), the Flemish employer federations VOKA and Agoria, and their Moroccan counterparts CGEM and APEBI, as well as Fedasil and the Flemish Agency for Migration.⁵⁴

The project ran between March 2019 and August 2020. In that time, 120 young unemployed Moroccans were trained with specific ICT skills. Those who entered the “away” track of the project also received language training in Dutch, as well as cultural awareness and integration training. While recruitment and mobility has been delayed due to COVID-19, there remains substantial interest from employers on both sides; the first trainees moved in late 2020.

As the first full pilot of the Global Skill Partnership model, the experience of PALIM has a lot to teach other countries of destination that are interested in such a model. Many of these lessons learned will be explored in the sections below. The project focused on the ICT sector which Enabel felt was more “doable” as there were no ethical difficulties with recruitment, no large technical difficulties in the skills required both in Morocco and Flanders, fewer language requirements, and opportunities for offshoring, remote work, and employer investment. Yet the rapidly changing demands of ICT companies meant that the project had to alert and flexible, conducting robust labor market needs assessments, getting strong training profiles from the relevant companies, and adapting the training (even mid-curriculum) to changing demand.

Enabel is planning to scale PALIM as part of a new project: Towards a Holistic Approach to Labour Migration Governance and Labour Mobility in North Africa (THAMM).⁵⁵ As part of this project, hundreds of Moroccans and Tunisians will be trained in ICT skills and placed with companies in Belgium and Germany, while facilitating entry into companies within countries of origin. This project is new, and the implications remain to be seen.

Source: Enabel. 2019. “PALIM—European Pilot Project Linking Moroccan ICT Development and Labour Shortages in Flanders.” Published March 1, 2019. <https://www.enabel.be/content/europees-proefproject-palim-linkt-it-ontwikkeling-marokko-aan-knelpuntderoepen-vlaanderen-0>

Since 1999, Belgian law has operated a selective immigration policy. Highly skilled workers must have a higher education diploma and a job offer that exceeds the legal threshold, but they are then able to obtain a work permit without employers having to subject the role to labor market tests. Employers of less skilled roles must prove those roles cannot be undertaken by local workers either through individual assessments or through those roles being “bottleneck vacancies” (which include ICT professionals).⁵⁶ Belgium has a devolved immigration policy and each of Belgium's four regions (Brussels, Flanders, Walloon, and the German community) has its own labor market policies and its

⁵⁴ Enabel. 2019. “PALIM—European Pilot Project Linking Moroccan ICT Development and Labour Shortages in Flanders.” Published March 1, 2019. <https://www.enabel.be/content/europees-proefproject-palim-linkt-it-ontwikkeling-marokko-aan-knelpuntderoepen-vlaanderen-0>

⁵⁵ International Labour Organization (ILO). “Towards a Holistic Approach to Labour Migration Governance and Labour Mobility in North Africa (THAMM).” https://www.ilo.org/africa/technical-cooperation/WCMS_741974/lang--en/index.htm

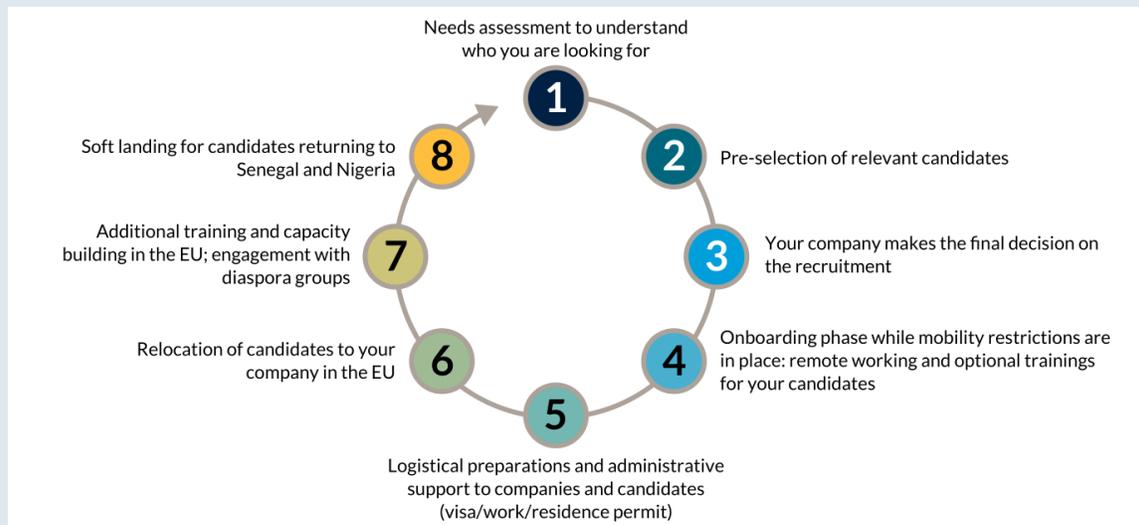
⁵⁶ Ramboll. “Bottleneck Vacancies in Belgium.” [https://ec.europa.eu/social/BlobServlet?docId=12644&langId=en#:~:text=Bottleneck%20vacancies%20are%20a%20widespread,lack%20of%20skills%20\(15%25\)](https://ec.europa.eu/social/BlobServlet?docId=12644&langId=en#:~:text=Bottleneck%20vacancies%20are%20a%20widespread,lack%20of%20skills%20(15%25))

own public employment office.⁵⁷ ICT professionals can apply to come to any of the four regions under this facilitated migration route and stay for a period of up to three years (the visa is renewable).

BOX 4. MATCH—HIRING AFRICAN TALENTS

MATCH is a 36-month initiative funded by the EU, aimed at matching highly skilled people in Nigeria and Senegal to private sector companies with skill needs in Belgium, Italy, The Netherlands, and Luxembourg. The project is not solely focused on ICT skills, though they are targeting those highly skilled. The initiative aims to create a pool of talent from which companies can draw, while also facilitating collaboration between companies and remote working options during COVID-19. It is also planning to implement skills development, capacity building, and knowledge sharing between participating countries.

Figure 1. MATCH in practice—an overview



Source: International Organization for Migration (IOM) Belgium & Luxembourg. “MATCH—Hiring African Talents.” <https://belgium.iom.int/match>

The project is new, and no talents have yet moved through the scheme. As Figure 30 shows, private sector companies would send their vacancy profiles to the IOM office in Belgium and Luxembourg. They would source candidates in Senegal and Nigeria using the private recruitment company Aldelia. Workers would then be screened by IOM, local employment agencies in Senegal and Nigeria, and Aldelia, and a shortlist then presented to the company. After online interviews and company specific tests, talent can then move to Europe. MATCH has chosen to work with Senegal and Nigeria given their different language profiles (French and English, respectively), developed ICT infrastructure, and ambitious plans for job creation and growth.

⁵⁷ Rachel Swain. 2020. “Work in Belgium.” Last updated July 2020. <https://www.prospects.ac.uk/jobs-and-work-experience/working-abroad/work-in-belgium>

Lithuania

In early 2020, it was announced that Lithuania had the fastest growing fintech sector in the European Union, growing 24 percent in recent years.⁵⁸ The country hosts 13 of the 20 largest ICT companies in the Baltic States and in 2015 there were projections that ICT investments would account for 25 percent of the country's GDP. The number of people working in the sector has grown 25 percent since 2015, and one in four students are studying Science, Mathematics, Computing, and Engineering courses.⁵⁹ Despite this pipeline of talent, Lithuania too is suffering from skill shortages. Many of the roles on the Labour Exchange of Lithuania's six-monthly projections are from the ICT sector.⁶⁰

In early 2019, Lithuania amended its law on the Legal Status of Aliens to create quotas for foreign workers from third countries based on a shortage list of occupations. The changes also made it easier for people from high-income non-EU countries to move to Lithuania, and for people from third countries to gain a Start-up Visa. Everyone else is subject to the quota system.⁶¹ Employers must first seek a worker from Lithuania before seeking expertise internationally. Those from third countries must have a formal qualification, a job offer, and experience within their sector for at least one year. At the end of that year, a Residence Permit may be issued.⁶²

BOX 5. DIGITAL EXPLORERS

Between January 2019 and September 2020, Lithuania entered into a partnership with Nigeria to promote the migration of ICT professionals. The project, financed by the EU's MPF, aimed to bring up to 50 young graduates to Lithuania for a 6-to-12-month career advancement program. The trainees would take part in tailor-made training courses and internships, as well as receive additional support in cultural integration and soft skills. Throughout this time, the trainees would build up their skills, while contributing to the growth and development of Lithuanian ICT employers. At the end of the project, the newly skilled graduates would return home to Nigeria to contribute their skills to Nigerian employers.

Given the lack of previous engagement between Lithuania and Nigeria, the project had to put a lot of effort into developing trust between partners and building stakeholder networks. In fact, the program was never conceived of as a labor migration pathway but more as a way to better connect the two countries. The majority of the project was implemented by the ICT sector itself. Interviewees felt this "bottom-up" approach helped build trust with the private sector far more than if it had been led by the government or other institutions.

In the end, the project moved 15 people. Project and migration costs were covered by Digital Explorers, while the salaries were covered by the employers. A stipend cost was shared between

⁵⁸ Portia Kentish. 2020. "Lithuania's fintech sector now fastest growing in EU." *Emerging Europe*. February 17, 2020. <https://emerging-europe.com/new-industry/lithuanias-fintech-sector-now-fastest-growing-in-eu/>

⁵⁹ Invest Lithuania. "Technology." <https://investlithuania.com/key-sectors/technology/>

⁶⁰ Migration Law Center. "The professions needed in Lithuania. A list of the most in-demand professions in Lithuania." <https://www.migration.lt/the-professions-needed-in-lithuania-a-list-of-the-most-in-demand-professions-in-lithuania>

⁶¹ China.cee. 2019. "Lithuania social briefing: Lithuania is planning to use quotas for third-country migrants according to the shortage of occupations." May 9, 2019. <https://china-cee.eu/2019/05/09/lithuania-social-briefing-lithuania-is-planning-to-use-quotas-for-third-country-migrants-according-to-the-shortage-of-occupations/>

⁶² Migration Law Center. "Employment of aliens in Lithuania." <https://www.migration.lt/employment-of-aliens-in-lithuania>

the project and employers. The project is now moving to develop a long-term pipeline of quality talent by investing in skill building in Nigeria and focusing on developing entrepreneurship skills. The second cohort will bring an all-female group of trainees to Lithuania for a six-month internship.

Source: <https://digitalexplorers.eu/> and interviews with key stakeholders

IMPLEMENTING A GLOBAL SKILL PARTNERSHIP

As described above, many European countries are experiencing large and persistent skill shortages, particularly within the ICT sector. While roles within the sector span from low- to high-skill, there is a growing number needed within the mid-skill bracket. European countries have long sought to attract highly trained ICT talent from countries of origin, including from Nigeria, but have (to date) done little to build the skills of potential graduates to satisfy ICT sector demand at both ends of the pathway.

Nigeria is also suffering from a lack of qualified ICT workers, a situation that is exacerbated by their highly fragmented and informal training system. Despite these shortages, the ICT sector in Nigeria is booming and it is on track to become one of the largest digital markets in the world. Hence there is a real opportunity for substantial and targeted investment in the ICT training infrastructure within Nigeria to develop talent that is qualified for roles at home and abroad.

One way to do this is through the Global Skill Partnership model. A Global Skill Partnership is a bilateral labor migration agreement between a country of origin and a country of destination. The country of origin agrees to train people in skills specifically and immediately needed in both the country of origin and destination. Some of those trainees choose to stay and increase human capital in the country of origin (the “home” track); others migrate to the country of destination (the “away” track). The country of destination provides technology and finance for the training and receives migrants with the skills to contribute to the maximum extent and integrate quickly.

Without closer inspection of how a Global Skill Partnership could be implemented in practice, it is difficult to develop a blueprint. Yet in this final section, we have attempted to outline some risks and mitigation measures which should be factored into the design, as well as ways in which to promote a genuine development benefit within the project.

Risks and Mitigation Measures

The full report which accompanies this case study mentions a number of design factors which need to be taken into consideration when designing a Global Skill Partnership. In addition to these, the ICT sector has three complicating factors.

The presence of offshoring within the industry. The impact of COVID-19 on offshoring is yet to be fully determined. On the one hand, the rise of remote work may lead to a digital revolution within a wider set of industries that lead some to offshore more, therefore reducing the need for skilled labor to move to the EU. On the other hand, it has also exposed vulnerabilities within supply chains and

some employers may want to offshore less to fortify their resilience to such shocks. Overall, it is important to keep in mind that there have been substantial skill shortages within the ICT industry for years before COVID-19, and these are likely to still be in place after the pandemic. There is a reason why employers do not offshore the entirety of their operations and why in-person staff will always be in demand. Therefore, while the trend toward more offshoring should be examined (and indeed, supported, as this would also provide opportunities to people in countries of origin) it should not be exaggerated.

The skill level and type of ICT professionals that EU countries are attempting to attract. All the skills examined in the companion report sit on a continuum of low to highly skilled. While health care skills can be medium or high skill, the ICT sector tends to blur these lines. The design of any Global Skill Partnership in ICT must be careful to pick skills which are in demand in both countries, and which cannot be facilitated through other legal migration routes such as the Blue Card directive or permissive national immigration policies.

The rapidly changing nature of the sector. The digital economy, by its very nature, is fast moving. The specific skillsets required by employers are likely to shift rapidly. What is in demand now, may not be in demand two years from now when workers are trained. Any partnerships must be alive to this reality. It is likely that implementation of an ICT Global Skill Partnership will need shorter training courses (six to nine months) which can fluidly adapt to changing private sector demand in both countries.

It is difficult to go into the specifics of how an ICT partnership could be funded given that the potential countries of destination (and the financial willingness of their employers) is unknown. Yet as described above, it may be useful to use the development assistance component of international organization financing to support the development of a pilot (as the PALIM project did). However, in the long run, an ICT partnership should look to transfer financial responsibility for the training of those on the “away” track to the private sector. To be able to transition into a more sustainable financing model, the pathway will need to demonstrate the impact of the program to employers by attempting to ascertain the changes in productivity and investment due to plugged skill shortages.

Promoting a Genuine Development Benefit

As discussed above, the ICT training infrastructure within Nigeria is highly fragmented and informal. Those interested in a career within the ICT profession often resort to online classes and/or informal work placements in computer repair shops. Many emerge with skills that are targeted at specific programming languages or specific data analysis tools, rather than general digital skills that are in demand among companies in Nigeria, let alone abroad. While there are a number of local and aid-supported start-ups attempting to remedy this situation, they could use more investment and support. A robust training curriculum and new training facilities should be created to support the training of a new cohort of ICT professionals to serve local ICT needs. Such a pipeline could, eventually, be used to support roles overseas. ODA should support the government in its efforts to reduce regulations in place which are constraining the growth of the sector and also help develop a sector analysis and growth plan to make the most of Nigeria’s booming market.

In addition to providing this targeted training in much-needed skills, any Global Skill Partnership in ICT with Nigeria must also take note of the nature of the market itself. Many employers prefer to hire contractors for short-term and targeted assignments, rather than bring on long-term or in-house workers. Many employees prefer to work this way too as they get to take on varied clients and develop their skills. Hence, it would be worth investing in entrepreneurship and business development skills training for these workers to help them find meaningful opportunities within the Nigerian ICT sector and grow their businesses to employ others.



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