MPRI-JAIMR | INTERNATIONAL JOURNAL OF AFRICAN INNOVATION & MULTIDSCIPLINARY RES.
VOL. 02 NO. 1 OCT-2023 ISSN: 1116 - 3240

# ADVANCING SUSTAINABLE DIGITAL ECONOMY: ICT SKILLS ACQUISITION AND OFFICE TECHNOLOGY AND MANAGEMENT PTOGRAMME

**UKONU, EGBE ELIZABETH; HABU JINGI UMAR; & HALILU, HAMMAN**

Department of Office Technology and Management, Federal Polytechnic, Mubi

## Abstract

This paper gave an insight on Advancing Sustainable Digital Economy: ICT Skills Acquisition and the Office Technology and Management Ptogramme. The digital economy is the worldwide network of economic activities, commercial transactions and professional interactions that are enabled by information and communications technologies (ICT). It brings exciting ways to indulge in entertainment, leisure, build contacts, make relations and procure services and goods from suppliers. There are various ICT skills needed for a sustainable digital economy, they are as follows: Using a computer – being able to use a computer is the basic digital skills, Analyzing Data, Managing Data, Navigating the Internet, Staying Safe Online, Communicating Online, Creating and editing online documents and Paying for products and services online. ICT has played significant role in advancing Digital economy, these roles are as follows: Workforce Transformation, Global Competitiveness. Entrepreneurship and Startups, Bridging the Skills Gap, Skill Demand in the Digital Economy, Enabler of Innovation and Growth among others. As good as ICT is in promoting digital economy, there are challenges the OTM programme face in ensuring quality instrucxtional delivery. The challenges ranges from Bureaucratic bottlenecks resulting in inadequate provision of ICT tools for OTM programme service delivery, Skills Gaps and Utilization of ICT Tools for instruction by lecturers, Costly and Irregular Internet Access for Hands-on Experience, High Cost of ICTs and Maintenance for effective service delivery, Policy Implementation Issues, Poor Infrastructure among others. Based on the challenges observed, the following suggestions were made**:** The government should have the political will to vote more money for education, this will cater for all the resources that will be required in the running of the OTM programme in their right and adequate quantities, Lecturers should be sent on workshops, conferences and in-service training to update their knowledge in the latest ICT gadgets, The management of institutions should make the laboratories to be accessible to students for constant practice to acquire the required skills for the digital economy.

**Keywords:** ICT skills, office technology and management (OTM) programme, sustainable, digital economy.



**EDITOR-IN-CHIEF**
**Prof. A.I. Mteiye [MALAWI]**

## Introduction

The digital economy refers to an economic system that is primarily based on digital technologies and the internet. It encompasses various economic activities, including online commerce, digital services, data analysis, artificial intelligence, and more. The digital economy is the worldwide network of economic activities, commercial transactions and professional interactions that are enabled by information and communications technologies (ICT). It can be succinctly summed up as the economy based on digital technologies. The digital economy reflects the move from the third industrial revolution to the fourth industrial revolution. The ICT industry stands at the centre of digital economy, serving as a reliable yardstick of its performance. The three main components of digital economy are e-business, e-business infrastructure and e-commerce. The global economy is undergoing a digital transformation, and it is happening at breakneck speed. Digital economy is the economic activity that results from billions of everyday online connections among people, businesses, devices, data, and processes. The backbone of the digital economy is hyper-connectivity which means growing interconnectedness of people, organizations, and machines that results from the Internet, mobile technology and the internet of things (IoT). The digital economy is taking shape and undermining conventional notions about how businesses are structured; how firms interact; and how consumers obtain services, information, and goods (Deloitte, 2023).

Digital Economy are orchestrated by digital transformation which is referred to as the Use of new digital technologies, such as social media, mobile, analytics or embedded devices, in order to enable major business improvements like enhancing customer experience, streamlining operations or creating new business models (Fitzgerald et al, 2023). As such, the Digital Transformation goes beyond merely digitizing resources and results in value and revenues being created from digital assets (McDonald and Rowsell-Jones, 2023). Digital Transformation is now commonly interpreted as such usage of Information and Communication Technology, when not trivial automation is performed, but fundamentally new capabilities are created in business, public government, and in people's and society life. As with any ICT-enabled change, it is not enough to bring the ICT to the organization (Benjamin & Levinson, 2023); the Digital Transformation success depends on process and operations management changes (Dremel et al, 2019). To accomplish sustainable digital economy, Office Technology and Management students must be trained in a change process that takes into account the unique challenges presented by Information Technology (Benjamin &Levinson, 2023). A digital revolution is positively developing the digital and standardized working environments (Lei & Jing, 2020).

Thus, the society as a whole is facing a fast and radical change due to the maturation of digital technologies and their ubiquitous penetration of all markets (Ebert & Duarte, 2016). To add to the increased demand from customers, companies are facing ever tougher competition due to globalization (Westerman et al, 2018) and putting pressure to go digital before others do, seeking to survive and attain competitive advantages (Bharadwaj, 2021). Successful Digital Transformation requires an organization to develop a wide-range of capabilities, which will vary in importance depending on the business context and the specific organization's needs. Digital technology needs to become central to how the business operates, and organizations effectively need to re-think and possibly re-invent their business models in order to remain competitive (Carcary et al, 2020).

The digital economy has created waves of disruption. New companies and new ways of interacting have emerged. According to Deloitte (2018), many companies and industries that did not or could not capitalize on the technologies to change their operations have faced declining sales, falling market share and even complete collapse. Leading business experts agree that the digital economy is at its start. To compete in the years ahead, organizations whether they are for-profit



EDITOR-IN-CHIEF
Prof. A.I. Mteiye [MALAWI]

businesses, service-oriented entities, such as healthcare systems, or non-profit and government institutions will need both leaders and employees who are able to innovate. They will need to leverage today's emerging technologies, such as IoT and prescriptive analytics, to better connect with existing and potential customers and to be more responsive while also being more efficient and effective. The purpose of this study is to examine the ICT skills needed for sustainable digital economy, the role of ICT skills in advancing sustainable digital economy, challenges faced in the acquisition the ICT skills and suggest solutions appropriately.

**Conceptual Review**

**Information and Communication Technology (ICT)**

ICT is fast becoming the largest distribution platform for providing public and private facilities and services to millions of people. The value of information and accumulated knowledge within developing countries is a strong point for national economic growth. ICT has emerged as a core driver of the modern knowledge based economy with its crucial role in advancing sustainable digital economy.

ICT provides opportunities to both urban and rural populations. One common contribution is that it increases productivity and links markets with and complements the development of industry, trade, learning, education, health and finance

The ICT-driven curriculum in OTM programme is important for grooming the student to acquire abilities in the use of computers, online self-learning packages, interactive electronic board usage, satellite, radio, television use and related technologies in information sharing (Yusuf & Onasanya, 2014).

**Office Technology and Management (OTM) Programme**

The Office Technology and Management (OTM) programme run in Polytechnics is mainly the course designed to service the demand for producing highly efficient breeds of administrative personnel who will manage the office records and information system and be self-reliant. Students admitted into the programme are expected to acquire appropriate skills, competencies and knowledge that equip them to service the workplace and for self-reliance, thereby contributing to an sustainable digital economy. The OTM programme is expected to develop in the students those capacities essential for developing the office management skills especially with emphasis on ICT competency skills, knowledge and attitudes essential for making the individual function effectively in the 21st century work environment and self-reliance, National Board for Technical Education (NBTE, 2020). This is on account of the fact that to effectively man the positions of secretaries, managers or administrative personnel in the evolving ICT driven workplace, or even for self-reliance, an individual must be compliant with the modern ICT trends.

**Sustainable**

Sustainable according to Hornby (2007) means able to be maintained at a certain rate or level, the ability to continue over a period of time. This means the ability of digital economy to be upheld and defended over a period of time without being compromised. Sustainable digital economy means meeting the country's digital needs without compromising the ability of future generations to meet their own needs. This study will therefore try to look into the ways Office Technology and Management Programme is run to sustain a digitized economy through looking at the courses that are taught in preparation for the actualization of a digitized economy and the implementation process of Office Technology and Management ICT-driven programme.

**Digital Economy**

The digital economy refers to an economic system that is primarily based on digital technologies and the internet. It encompasses various economic activities, including online commerce, digital

services, data analysis, artificial intelligence, and more, Deloitte (2018). The rapid growth of the digital economy has led to an increased demand for individuals with Information and Communication Technology (ICT) skills. Here's a closer look at the relationship between the digital economy and ICT skills.

**ICT Skills that drive Sustainable Digital Economy**

Digital skills refer to the skills required to use digital devices, communication applications and networks, to manage and share information such as computer programme, smart phones app or spreadsheet. There are three types of ICT skills required for sustaining digital economy. They are ICT generic skills used to perform everyday work such as word processing, and to access website, the ICT specialist skills are used to program, develop application and manage networks and the ICT complementary skills are used to perform multiple aggregate tasks such as processing complex information, communicate with others, solve problems and manage teams. But for the purpose of this study, the generic and complementary skills will be projected. The following ICT skills are therefore required in OTM programme to drive digital economy: Using a computer – being able to use a computer is the basic digital skills, Analyzing Data, Managing Data, Navigating the Internet, Staying Safe Online, Communicating Online, Creating and editing online documents and Paying for products and services online.

**ICT Courses Taught in OTM Programme**

ICT based education and socioeconomic development programmes provide innovative solutions to defeat poverty. The most important role of ICT to the society is that ICT permeates all aspects of life, providing newer, better and quicker ways for people to interact, network, seek help, gain access to information and learn. The following ICT courses are taught in the OTM programmes in Polytechnics: Keyboarding, Mo dern Office Technology, Desktop Publishing, Web Page Design, ICT Office Application I, ICT Office Application II, Database Management, Advanced Desktop Publishing, and Advanced Webpage Design

**Role of ICT Skills in Advancing Sustainable Digital Economy**

The ICT provides for the generation, processing, dissemination, receiving, decoding, storage and retrieval of information. The use of the ICT application for example in education has also brought about a revolution of tremendous proportion in educational practice especially in cases of conducting examinations, processing and conveying the results, distance education transmission, classroom teaching and conducting research. In other words. The following are the roles ICT skills play in advancing sustainable digital economy according to Manyika et al (2016):

**1. Skill Demand in the Digital Economy**

The digital economy heavily relies on technology and data-driven processes. As a result, there is a growing demand for individuals who possess ICT skills. These skills include programming, data analysis, cyber Security, digital marketing, web development, and proficiency in using various software tools.

**2. Enabler of Innovation and Growth**

ICT skills play a pivotal role in driving innovation within the digital economy. Skilled individuals can develop and implement new technologies, applications, and solutions that address evolving market demands. This innovation, in turn, fuels economic growth by creating new business models and opportunities.

**3. Bridging the Skills Gap,**

The rapid evolution of technology often leads to a skills gap, where the demand for skilled workers surpasses the supply. To bridge this gap, efforts are made to provide education and training in ICT-related fields. Upskilling and reskilling programs help individuals acquire the necessary skills to participate in the digital economy.


EDITOR-IN-CHIEF
Prof. A.I. Mteiye [MALAWI]

**4. Entrepreneurship and Startups**
ICT skills empower entrepreneurs to establish and grow digital businesses. Startups in areas such as e-commerce, app development, fintech, and online services rely on skilled individuals to create, manage, and innovate their digital products and services.
**5. Global Competitiveness.**
Nations with a well-trained workforce in ICT skills are better positioned to compete in the global digital economy. Skilled workers contribute to the development of technology ecosystems, attract foreign investment, and enhance a country's overall economic competitiveness.
**6. Workforce Transformation,**
The digital economy's growth often leads to the transformation of traditional industries. Automation, artificial intelligence, and data analytics are reshaping how businesses operate. Workers with ICT skills are better equipped to adapt to these changes, enhancing their employability and resilience.
**7. Policy and Education**
Governments and educational institutions play a crucial role in fostering the development of ICT skills. They formulate policies that encourage investments in technology education, provide training opportunities, and promote digital literacy at all levels of society.
**8. Inclusivity and Diversity**
Ensuring that a diverse population has access to ICT education and skills development is vital for creating an inclusive digital economy. This inclusivity helps prevent the digital divide and allows a wider range of individuals to benefit from digital opportunities.

**ICT Tools and facilities used for Instruction in OTM Programme**
The modern emphasis in the OTM programme being on Information and Communications Technology (ICT), students are then expected to develop the knowledge, skills and competencies for an effective functioning in the ICT dispensation in an effort to promote digital economy The following are the ICT Tools used for instruction in OTM Programme:

**Multimedia communication facilities**
- Photocopier
- Public address system
- Projector system
- Digital Camera
- Television
- Mobile phone
- Radio transmission

**Internet Facilities**
- Router
- Satellite dish
- Satellite decoder
- Date facility subscription
- Technician
- Modem

**Computer (Desktop/Laptop)**
- Wireless mouse
- Electronic board
- Networked laboratory

- Printers
- Storage devices

**Challenges faced by OTM students in acquiring ICT Skills**

1. **Skills Gaps and Utilization of ICT Tools for instruction by lecturers**

   The proper dispensation rests mostly on the lecturers' ability to use the ICT tools and facilities available for the programme. If the lecturer is not updated enough to employ and use the ICT scheme to educate the students, the students cannot be expected to develop the required skills. It means therefore that to brace up with the modern trends in information gathering, storage, processing and dissemination, an ICT competency will be needed for the lecturer. This is particularly against the background that the modern trends have taken a shift from typewriting and hardcopy file storage to the technique of computerized information management scheme. The lecturer of the OTM programme need to have the competency to operate in this ICT techniques in order to be able to effectively groom students to acquire and master the skills. A lecturer that lacks the competency to functionally operate in the ICT techniques can never be expected to groom students who will develop a mastery of what their teacher did not possess.

   The OTM programme in Polytechnics emphasizes quality instructional delivery in each institution. Quality instructional delivery in this regard implies that the course curriculum and instructional process must meet the inculcation of relevant digital skills into the students. This further demands that qualified experts are those engaged to train students to acquire these skills. Such lecturers should be those equipped to adequately utilize the ICT tools and facilities in the teaching and skills advancement of students. This is in line with the stand of the National Board for Technical Education (NBTE, 2020) which emphasizes that a skilled manpower should be engaged to drive the inculcation of the skills demanded by technologies in the industry.

2. **Bureaucratic bottlenecks resulting in inadequate provision of ICT tools for OTM service delivery**

   The effective utilization of ICT in teaching and learning cannot be achieved without the availability of required facilities. The availability of the ICT tools and facilities is what can allow for providing multiple technologies (e.g. video, computer and online communication) that enhance providing students with visualization aids. Undoubtedly, without the adequate provision of tools and facilities for the OTM programme, lecturers cannot be expected to teach optimally. As observed in earlier literature (Bamiro & Liverpool, 2019; and Akuegwu, Ntudikem & Jaja, 2018), lecturers can only transfer or transmit ideas and skills to students when relevant facilities are provided for teaching. This is to emphasize that conducting laboratory practical exercises and workshop activities depend on the facilities present for the OTM programme. In other words, the total development of the students in their cognitive, affective and psychomotor domains will occur only in the conducive environment. This is the kind of environment with laboratories, workshops, tools and equipment provided in their right quantities to enhance the students' adequate grooming in secretarial and management services.

3. **Costly and Irregular Internet Access for Hands-on Experience**

   Other important factors that could affect the successful implementation of an ICT-driven curriculum in the OTM programme include the accessibility to ICT tools and having in service qualified technical instructors. According to Ergdogu and Ergdogu (2019) the accessibility to ICT tools is viewed from various angles. Firstly, the tools and facilities need to be in a functional state before they can serve in the lessons delivery. Secondly, the OTM operating personnel should be abreast with the way such tools and facilities can be put to use for the instruction process. The extent to which these requirements are met

contributes another dimension for measuring the graduates' efficiency for 21st century work place and self-reliance.

4. **High Cost of ICTs and Maintenance for effective service delivery**
It can further be noted that part of the challenges that may confront the lecturer in dispensing the OTM programme with a focus on the students' ICT competency development include the provision and functionality of the requisite tools and facilities in the institution, Lei, Z., and Jing, Y. (2016). Without doubt, the Polytechnic would require the ICT resources in their functional state to enable even the competent lecturer to teach and transfer appropriate skills and qualities into the students.

5. **Policy Implementation Issues** - No doubt, vocational technical education has made some notable impacts on the Nigerian society, especially in respect to the products of the training programme who are contributing their quota to the economic growth and development of the nation through various industrial establishments (Czernich et al 2009). Inadequate funding of vocational institutions has caused not fully implementing the programme thereby turning out of half-baked graduates because there is no fund to build and maintain workshops, laboratories or even purchase modern equipment. Manyika et al (2016) observe that government lack of commitment to technical education and inadequate funding has weakened technical education in Nigeria. A direct consequence of this is that while the number of technical education institution is dwindling that of general education is growing in bounds (Manyika et al 2016).

6. **Poor Infrastructure** - Most technical education departments in Nigerian Polytechnics do not have well equipped laboratories or workshop space, let alone useable equipment and where they exist, they are grossly inadequate. The available facilities, programme as at today are inadequate quantitatively and qualitatively. Czernich et al (2009) also observe that the few laboratories, experience acute shortage of laboratory equipment and supplies.

**Conclusion**

The digital economy permeates all aspects of our society, including the way people interact, the economic landscape, the skills needed to get a good job, and even political decision-making. These changes are gradually happening all around us. With the full implementation of a digital economy, the ways in which people connect with others, with information, and with the world is being transformed through a combination of technologies. These technologies will help us solve increasingly sophisticated problems. The digital economy relies heavily on individuals with ICT skills to drive innovation, entrepreneurship, and growth. As technology continues to shape industries and economies, the demand for these skills is expected to persist and even increase. ICT skills are crucial for sustainable digital economy as they enable various sectors to operate efficiently, access information, and find innovative solutions to complex challenges. Therefore, investing in ICT skills acquisition in OTM programme is a strategic approach for both individuals and societies looking to thrive in the digital age.

**Suggestions**

Based on the challenges observed, the following suggestions were made**:**

1. The government should have the political will to vote more money in education, this will cater for all the resources that will be required in the running of the OTM programme in their right and adequate quantities
2. Lecturers should be sent on workshops, conferences and in-service training to update their knowledge in the latest ICT gadgets
3. The management of institutions should make the laboratories to be accessible to students for constant practice to acquire the required skills for the digital economy



EDITOR-IN-CHIEF
Prof. A.I. Mteiye [MALAWI]

## References

Akuegwu, B. A., Ntukidem, E. P., Ntudikem, P. J & Jaja, G. (2018). Information and Communications Technology (ICT) facilities utilization for quality instructional services delivery among university lecturers in Nigeria. *Review of Higher Education in Africa,* 3 (1), 78 - 85.

Bamiro, O. & Liverpool, S. (2019). ICT and university administration: The Ibadan and Jos examples. *The University Administrator*, 1 (4), 29 - 39.

Benjamin, R., Levinson, E. (2023). A framework for managing IT-enabled change. *Sloan Manag. Rev.* 34(4), 23–33.

Bharadwaj, A. (2021). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Q. 24(1),* 169–196.

Carcary, M., Doherty, E., Conway, G. (2020). A dynamic capability approach to digital transformation–a focus on key foundational themes. 10th European Conference on Information Systems Management. Academic Conferences and publishing limited, 20–28. .

Czernich, N., Falck, O., Kretschmer, T. & Woessmann, L. (2009). Broadband infrastructure and economic growth. *CESIFO Working Paper 2861*. University of Munic: Centre for Economic Studies Information and Forschung (CESIFO).

Deloitte, H. (2018). What is the impact of mobile telephony on economic growth? Available from www.gsma.com/publicpolicy/wp-content/uploads/2018/11/gsma-deloitte-impactmobile-telephony-economic-growth.pdf.

Deloitte , H. (2018). What is digital Economy? Available from https://www2.deloitte.com/mt/en/pages/technology/articles/mt-what-is-digitaleconomy.html'.

Dremel, C., Wulf, J., Herterich, M., Waizmann, J., Brenner, W. (2017). How AUDI AG established big data analytics in its digital transformation. *MIS Q. Executive 16(2),* 81– 100.

Ebert, C., Duarte, C. (2016). Requirements engineering for the digital transformation: Industry panel. Requirements Engineering Conference IEEE 24th International, 4 – 5.

Erdogdu, E. & Erdogdu, F. (2014). The Impact of access to ICT, students' background and school/home environment on academic success of students in Turkey: an international comparative Analysis. *Journal of Education*, 4 (2), 97 - 108.

Fitzgerald, M., Kruschwitz, N., Bonnet, D., Welch, M. (2023). Embracing digital technology: A new strategic imperative. *MIT Sloan Management Review*, Research Report.

Koutroumpis, P. (2009). The economic impact of broadband on growth: A simultaneous Approach. *Telecommunications Policy* 33.9: 471–85.

Lei, Z., & Jing, Y. (2016). Study on human resource reform in the digital transformation. *Proceedings of the 2016 Joint International Information Technology, Mechanical and Electronic Engineering.* AER – Advances in Engineering Research, 59, 471– 477.

Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P. & Seong, J. (2016). Digital America: A tale of the haves and have-mores. McKinsey Global Institute.

McDonald, M., Rowsell-Jones, A. (2023). The digital edge: Exploiting information & technology for business advantage. Gartner Inc.

NBTE. (2020). *National Board for Technical Education (NBTE) to push for establishment of more vocational institutes*. Kaduna: NBTE Publications.

Yusuf, A. & Onasanya, R. (2014). Role of ICT in professional development of teachers. *Learning Community*, 6 (3), 127 - 133.



**EDITOR-IN-CHIEF**
**Prof. A.I. Mteiye [MALAWI]**