



FRAMEWORK FOR DIGITAL SKILLS ACQUISITION FOR GLOBAL COMPETITIVENESS BY BUSINESS EDUCATION STUDENTS OF TERTIARY INSTITUTIONS IN NIGERIA

¹OKUTE AGNES LAWRENCE, Ph.D

Department of Vocational Education, University of Calabar, Calabar
agnesokute@unical.edu.ng, agnesokute@gmail.com

²ENANG CHRISTIANA ETONG, Ph.D

Learning and Development Department
Office of the Head of Civil Service of the Federation
Federal Secretariat, Phase II, Abuja-Nigeria
christianaenang@yahoo.co.uk
christianaenang@gmail.com
etong.christiana@fedcs.gov.ng

³ETOMA MOSES GEORGE

Department of Vocational Education,
University of Calabar, Calabar
mosesetoma@unical.edu.ng

Abstract

The digital era calls for continuous acquisition of new skills and updating of existing skills in order to align with global trend. This is because new technologies are emerging at an exponential rate, with attendant need for constant change in work environment. This underscores the need for this paper which is a framework for digital skills acquisition for global competitiveness by business education students in tertiary institutions in Nigeria. The Paper proposed a framework for digital skills acquisition in three dimensions, namely: Use of digital systems and tools, use of software application and application of security measures in a digital environment. The paper identified skills cluster that should be structured as a framework in each of the skills dimension proposed. The paper concludes that the acquisition of digital skills by business education students of tertiary institutions in Nigeria is fundamental in the 21st century and beyond if they must be globally competitive. It was suggested, among others, that the three levels of digital skills and the skills clusters identified should be embedded in the curriculum of business education at the tertiary level.

Keywords: Digital skills, tertiary institutions, business education, framework.

Introduction

Globally, the use of digital technology which gives people access to huge amount of information has necessitated the acquisition of a new set of skills to access, manage, integrate and evaluate information. All over the world, the workplace is changing as a result of computerization, automation and mechanization of which Nigeria is not an exception. To be



relevant after graduation, students of business education need the acquisition of new sets of skills which are referred to as digital skills. This is so because studies carried out by Helsper and Reisdorf, (2016) have revealed that public and private organizations worldwide are embarking on digitalization of their services which is becoming a risk on the general public becoming digitally excluded. The danger of becoming digitally excluded poses a threat to all individuals who do not have the necessary skills to handle the digitization of the various services of life domains. Also, research carried out by experts in the field of digital skills like van Deursen and van Dijk (2014) and Helsper and Eynon (2013) stressed that digital skills and competences, and the ability to make use of digital media in an autonomous and strategic way, are of increasing importance to ensure full participation in the digital work environment by users.

A key element on the agenda of many scholars, practitioners and policy makers worldwide is the development of digital skills and competences in order to ensure citizens' ability to fully participate in today's increasingly digitized society. Thus, scholars in the field of digital skills often make use of conceptual framework and models on digital literacy. This is because models and framework play a vital role in gaining insight into the concepts and ideas put forward by experts. A framework is structure that underlies the context in which an idea can be better explained. Digital Skills according to van Deursen, Helsper, and Eynon (2014), and van Dijk and van Deursen, (2014), refer to the technical aspects of competences and knowledge. They distinguish between six types of practice-oriented skills as follows:

- i. operational skills known as "button knowledge" that refers to the operational manipulation of computer and Internet software and hardware;
- ii. formal skills, or the ability to understand and use formal characteristics of computer and Internet, such as hyperlinks or move between Internet pages;
- iii. information skills, or the skills required to search, select, handle and critically evaluate Internet and digital media contents;
- iv. strategic skills, or the capacity to use Internet to one's personal advantage;
- v. communication skills required to participate in online networks, online communication strategies; and
- vi. content creation skills needed to create and distribute content on the Internet

Another practice-oriented interpretation of skills is used in the European Qualifications Framework (European Commission, 2008). In the framework, the distinction is made between knowledge, skills and competence. Knowledge is defined as "the body of facts, principles, theories and practices related to a field of work or study". Skills are referred to as "the ability to apply this knowledge", whereas competence is seen as "the proven ability to use these sets of knowledge and skills for one's personal development". Digital skills according to the framework are seen as the more practical and measurable outcomes of media, information or digital literacy. Martin and Madigan (2006) conceptualization of digital literacy corroborate the distinction between skills and literacy thus, digital literacy is the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyze and synthesize digital resources, construct new knowledge, create media expressions, and communicate with others, in the context of specific life. Digital skills are discrete, multi-step procedures enabling the operators to navigate through a series of menus and submenus to set parameters and execute commands. The acquisition of digital skills and the use of computer-based tools are expected of graduates of business education programme in



tertiary institutions.

Tertiary institutions have a key role in the digital transformation of our societies, particularly in addressing the need for adequate skills. According to Okute and Agomuo (2014), tertiary institutions are the third tier of learning that provides training in an ever-increasing number of specialized knowledge and skills for modern society. It is incumbent on all business educators as stakeholders in education to pay greater attention to educating their students for sustainable development. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2014), education for sustainable development allows every human being to acquire the knowledge, skills, attitude and values necessary to shape a sustainable future. For business education programme to be sustainable, its recipients at the tertiary level are expected to be equipped with appropriate knowledge and skills for global competitiveness in a digital era that is highly dominated with technology. Similarly, Enang and Okute (2019) pointed out that skills and knowledge are the engines of economic growth and social development of any nation. Therefore, business education students are expected to adequately acquire these skills to enable them fit into the digital work environment in which they will find themselves upon graduation from the university, if they must be relevant and compete favourably with their counterparts in a highly competitive global marketplace where knowledge and skills are the major commodities for survival in any endeavour.

As the digital transformation is moving ahead, the question of digital skills has become a societal challenge. Iordache, Mariën, and Baelden, (2017) stated that people should be equipped with the right skills to make use of the new possibilities in their work. This is because labour markets are changing due to automatization. As pointed out by the Organization for Economic Cooperation and Development (OECD) the need for mid-skilled labour has decreased while that for high-skilled labour, often university graduates, has increased over the last decades (OECD, 2018). Digital technologies have the potential to change the way we work and interact, which is likely to create new opportunities, but also challenges (Thomas, 2019).



Fig. 1. Framework for digital skills

It is based on these challenges that digital skills acquisition for business education students in tertiary institution in Nigeria becomes a necessity.

Business education is that aspect of Technical and Vocational Education and Training (TVET) involving, in addition to general education, the study of technologies and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of the economy and social life (FGN, 2013). Business education is also an educational



programme offered in tertiary institutions in Nigeria. It is a programme designed to inculcate in the students the understanding, values, knowledge, and skills required for efficient performance in the world of work. The need to prepare business education students to fit into the global market of the 21st century and beyond requires the acquisition of digital skills. It is imperative to develop a framework for digital skills acquisition for business education students in tertiary education in Nigeria, with emphasis on the use of digital systems and tools, software applications and security measures in a digital environment. The diagram below presents the framework for digital skills acquisition for business education students.

Literature on framework for digital skills acquisition that would be suitable for business education students were sourced from e-skills UK Sector Skill Council (2009), Smith and Anderson (2010), Centiport (2008), Chinien and Boutin (2011), van Deursen and van Dijk (2014), Helsper and Eynon (2013). The literature pointed to the fact that digital skills acquisition is imperative for functional participation in the digital world.

This paper examines the framework for digital skills acquisition in three (3) dimensions, namely:

- Use of digital systems and tools
- Use of software application; and
- Application of security measures in digital environment

Use of Digital Systems and Tools

There is no gainsaying the fact that the success of every activity in a digital world is anchored on the versatility of the worker in the use of digital systems and tools. The Business education students must be adequately equipped to meet job requirements in the use of these digital systems and tools. The onset of the global Coronavirus also known as COVID-19 pandemic in the latter part of 2019 that suddenly shut down the world economy with the attendant lockdown has made it more compelling for both the teachers and the thought to be more conversant with the use of digital systems and tools. Therefore, the students need to be prepared to meet this demand, and the teachers need to constantly update their knowledge to be able to align with the global knowledge and skill expectation. This is more so because no matter how sophisticated the digital systems and tools are, their utilization and capacity to enhance performance is dependent of the knowledge, skill and competency of the teacher that facilitates the learning activities. That is why learning at home using e-learning is difficult especially in developing countries, Nigeria for example, where power supply, internet connectivity, affordability of laptops and other online infrastructure are the exclusive right of the most privileged few. Even those who can afford all of these still need the guidance of facilitators.

The skills cluster in the use of digital systems and tools generated by these researchers is presented in table 1.



Table 1: Framework for Acquisition of Digital Skills by the use of Digital Systems and Tools

Use of Digital Systems and Tools	Digital Skills Cluster for the Use of Digital Systems and Tools by Business Education Students
Types of Digital Tools and Systems	<ul style="list-style-type: none"> <input type="checkbox"/> Ability to: <input type="checkbox"/> Identify types of digital systems and tools like the desktop computers, laptops, Ipad, et cetera. <input type="checkbox"/> Select, set up and use digital systems and tools to access, process and communicate information <input type="checkbox"/> Identify the function of different digital systems and tools and hardware components <input type="checkbox"/> Identify different input and output devices and how there are connected and installed in digital systems and tools <input type="checkbox"/> Identify the factors to consider when purchasing digital systems and tools <input type="checkbox"/> Identify the role of the Central Processing Unit (CPU) including how the speed of a microprocessor is measured. <input type="checkbox"/> Identify concepts related to computer memory like measurement of memory, RAM, ROM, et cetera. <input type="checkbox"/> Identify the features and benefits of storage capacity, shelf-life, etc. of different storage media. <input type="checkbox"/> Identify how to maintain digital systems and tools and troubleshoot common problems relating to different hardware. <input type="checkbox"/> Identify factors that can cause damage to computer hardware or media like environmental factors, magnetic fields, etc. <input type="checkbox"/> Identify how to protect hardware from fluctuations in the power supply, power outages and other electrical issues such as use of computers on different electrical systems. <input type="checkbox"/> Customize work environments by using digital systems and tools to access, process, communicate, collaborate, learn and solve problems. <input type="checkbox"/> Migrate to new digital system and tools as they advance.

Table 1 presents the framework for skills cluster necessary for use of digital systems and tools as proposed by the authors of this paper. Business education students are expected to acquire computational procedures that are required everywhere to manage job tasks. The ability to solve problems with digital technologies is linked to the achievement of work-related goals, which in turn take the form of concrete, practical tasks that requires the use of hardware devices which rely on digital technologies such as desktop or laptop computers, PDAs, mobile phones, etc, (Chinien & Boutin, 2012). The acquisition of digital skills and competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It includes basic skills in ICT which is the use of computers to retrieve, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet. Digital skills encompass functional aspects involving interpersonal attributes of social and organizational skills and ethical values.



Digital skills contain the basic knowledge of how to deal with the hardware and software of digital tools. Åkerblom, (2012) states that the digital workplace is evolving and new tools are doing old things. Business education students who are ready for the world of work should be prepared to collaborate in different spaces of knowledge sharing, and in real time find the information they need to solve problems using digital systems and tools.

Organizations deploy a variety of information systems to support the creativity and innovation of workers, as knowledge management aims to identify, create, represent, distribute, and enable adoption of insights and experiences. The first step toward using digital tools to retrieve and use information is acquiring the skills required to use the technology. Therefore, it is appropriate that the acquisition of digital skills by the use of digital system and tools for Business Education Students be introduced by tertiary education institutions in Nigeria.

Use of Software Application

Software is the general term used to describe the various kinds of programmes that are used to operate and manipulate computers and their peripheral devices. In a digital era such as this, business education students are expected to acquire the basic skills for the use of software application in the performance of their various tasks. There are basically two major types of software, namely, application software and system software. Application software refers to a variety of programmes that are used to accomplish specific tasks. Application software directs the performance of a particular use of computer to meet the information processing needs of users. Application software is categorized as general-purpose and function-specific application (O'Brien & Marakas, 2008). General-purpose application programmes are those developed to enhance the performance of common information processing tasks for end users. General-purpose application software includes word processing, spreadsheet, database management and graphics programmes. These programmes are commonly used with microcomputers to accomplish different purposes for home, education, business and many other purposes (O'Brien & Marakas, 2008; Inyang & Ekpenyong, 2012). Function-specific application software refers to those programmes designed to support the specific application of end users in business and other fields. Examples include specific software for accounting operations, human resource management, e-commerce, customer relationship management etc.

System software consists of programmes developed to enable the functioning of the computer and its processing activities. System software is concerned the control and functionality of the computer. Without the system software, no application software can run on any computer. System software consists of those programmes that control the operation of the computer. Examples of system software include different types of operating system like Disk Operating System (DOS), Windows Operating System (WinOS), Macintosh OS and UNIX/Linux OS

The operating system manages the software and the hardware, as well as provide interface which the installed applications can work with. There are numerous other functions of the operating system. Language translators and utility programmes are also components of system software application.

Table 2 presents the framework for digital skills cluster on use of software application.



Table 2: Framework for Acquisition of Digital Skills by the Use of Software Applications

Use of Software Applications	Skill cluster for the use of Software Applications by Business Education Students
Types of skills	<p>Ability to:</p> <ul style="list-style-type: none"><input type="checkbox"/> Identify how software and hardware work together to perform tasks and how software is developed and upgraded.<input type="checkbox"/> Identify the difference between an operating system and application software.<input type="checkbox"/> Identify issues relating to software distribution like licenses and upgrades.<input type="checkbox"/> Shut down, restart, log on and log off the digital systems and tools.<input type="checkbox"/> Start and run programmes on digital systems and tools.<input type="checkbox"/> Manipulate windows by minimize, maximize and resize.<input type="checkbox"/> Manipulate desktop folders and icons and shortcuts.<input type="checkbox"/> Manage files by identifying files, folders, directories, moving and retrieving files, display file properties, etc.<input type="checkbox"/> Identify precautions to take when manipulating files including using standardized naming conventions.<input type="checkbox"/> Solve common problems associated with working with files like incompatibility of application programmes corruption of files, denied access, etc.<input type="checkbox"/> Identify and display different control panel system preference settings<input type="checkbox"/> Change simple settings like date and time, audio, security, etc.<input type="checkbox"/> Install and uninstall software including updates from online sources<input type="checkbox"/> Identify fundamental concepts relating to word processing and common uses for word processing applications.<input type="checkbox"/> Identify fundamental concepts relating to spreadsheets and common uses for spreadsheet applications.<input type="checkbox"/> Identify fundamental concepts relating to presentation software and common uses for presentation applications.<input type="checkbox"/> Identify fundamental concepts relating to databases and common uses of database applications like fields, tables, queries, reports, etc.<input type="checkbox"/> Identify fundamental concepts relating to graphic and multimedia programs and common uses for graphic or multimedia software like drawing, painting, animation tools, etc.<input type="checkbox"/> Identify fundamental concepts relating to education and entertainment programs like computer based training (CBT), video, audio, etc.<input type="checkbox"/> Identify and troubleshoot common problems associated with installing and running software applications.<input type="checkbox"/> Comply with legal copyright provisions on software applications.<input type="checkbox"/> Migrate to new software applications as there are developed.

Table 2 present the digital skills cluster for use of software application as proposed by the authors of this paper.



Digital skills are often characterized by competency with computational basics, hardware, software, and networks (Jenkins, 2006; Trilling & Fadel, 2009). The acquisitions of these skills are important for the business education students who are expected to perform competently and efficiently and effectively in any area of business occupations, whether in the teaching profession, managerial positions in the public or private sector, in entrepreneurial endeavour. Basic information technology competency appears in virtually every study of digital literacy as it is the foundation upon which all other digital literacy skills are based. A mastery of operating technology does not alone create the digitally literate person. Research has indicated that technical capability is only one part of the equation, stressing that more intangible ways of thinking and acting and other knowledge on the culture of technology and its risks and rewards is equally necessary. Other scholars like Lankshear and Knobel, (2008); Martin, (2010); Dede; (2010) also agree with this necessity of multi-level competency and technical skills and that computer skills are only one dimension of digital literacy. In practice, this translates to an introduction to the skills required to operate a variety of computer applications programmes like word processing, databases, spreadsheets, presentation skills, etc, together with some general IT skills, such as copying disks and generating hard-copy printout. It is expected of business education to acquire the use of application software in order for them to fit in the world of work of the 21st century and beyond after graduation.

Acquisition of digital skills clusters of knowing and using hardware, and knowing and using digital software applications are fundamental for business education students in the tertiary institutions. Since the Internet has become a part of everyday life, business education requires the skills and competences to make full use of the medium. Lordache, Baelden, and Mariën, (2016) stated that the ability to know where to seek assistance, both online and offline, is related to concepts such as autonomy and problem-solving, which have been identified as important factors in the development of digital skills and competences. Problem-solving skills can have a positive effect on the development of digital skills and competences, helping users identify the correct digital tools needed to reach their goals, as well as enhance their ability to use digital tools in order to solve conceptual, but also technical problems. This knowledge could empower the business education students to act independently in the development of their digital skills, to search for information, and to solve problems they may encounter.

Application of Security Measures in Digital Environment

The increasing use of digital technology to acceleration business activities, the exponential rise in online transaction, and the proliferation of internet access have created a big problem – that of security. There is increasingly high threat of cybercrimes associated with networked transactions in today's digitalized business environment. It is a common phenomenon these days that unscrupulous fraudsters hack into people's, bank accounts, email and other sensitive private information via the internet. O'Brien and Marakas (2008) asserted that today's networked business enterprises are faced with security as a major management challenge. Business education programme should equip the students with those digital skills that will enable them adopt and integrate security measures to protect the accuracy, integrity and safety of information processes and systems. This is pertinent in order to forestall or ameliorate the menace of errors, fraud and losses occasioned by cybercrimes in the course of transacting businesses in a digital environment.

A framework highlighting the skills cluster that will enhance the security management while transacting business in a digital environment as proposed by Okute, Enang and Etoma in this paper is presented in Table 3.



Table 3: *Framework for the Application of Security Measures in a Digital Environment*

Digital skills Acquisition	Skills cluster for the Application of Security Measures in a Digital Environment by Business Education Students
Application of Security Measures	Ability to: <ul style="list-style-type: none"><input type="checkbox"/> Identify different types of anti-virus software and use them to protect data from cyber attacks.<input type="checkbox"/> Install local firewall on digital systems and use same to protect systems<input type="checkbox"/> Distinguish between hoaxes and real threat warnings<input type="checkbox"/> Securely connect to network in order to send and open digital messages and content<input type="checkbox"/> Encrypt sensitive information<input type="checkbox"/> Backup and store digital contents<input type="checkbox"/> Delete sensitive digital content<input type="checkbox"/> Secure user ID and password<input type="checkbox"/> Protect digital content against accidental destruction<input type="checkbox"/> Protect unauthorized use and modification of digital content<input type="checkbox"/> Comply with legal issues of digital contents<input type="checkbox"/> Determine trustworthiness of digital sources<input type="checkbox"/> Identify digital frauds, suspicious activity and cybercrimes<input type="checkbox"/> Practice safe online behaviours<input type="checkbox"/> Secure personal information against identity threats<input type="checkbox"/> Maintain a secure digital footprint<input type="checkbox"/> Report suspicious online activity<input type="checkbox"/> Report breaches on insecurity<input type="checkbox"/> Comply with employer’s digital policy

Table 3 presents the digital skills cluster for application of security measures in a digital environment as proposed by the authors of this paper.

In order to prevent technology lock-in or unforeseen negative consequences, students of business education need to know the basic technology issues and contexts that accompany the knowledge economy especially the Application of Security Measures in a Digital Environment. This includes an understanding of the risks associated with the use of digital technology, the possibility of loss of information or mistranslation when using digital tools in various social contexts, and legal or social issues that affect technology use (Trilling & Fadel,2009). Moreover, the prevalence of internet fraud and other internet-mediated crimes has made it imperative for all business educators to be equipped with adequate skills in the application of security measures while working in a digital environment.

Privacy and the implications of an online use is another key knowledge area, which includes items such as knowing how to manipulate the various Facebook and Twitter privacy controls and why they matter. Knowing privacy controls and their implications become especially important when technologies change their



default access or interface, such as in the case of Facebook's recent transition to the Timeline format, which had dramatic social consequences for those who were less informed of Facebook's privacy controls. This category also includes an understanding of the programmed nature of technology. Rushkoff (2010) argues that technologies embody the values of their designers and that people should know these frameworks in order to meet their personal and organisational goals. Rushkoff also added that a broader knowledge of the underlying social constructs and learning the reasons under which technologies are designed is extremely valuable for the digitally literate person. This knowledge would give students of business education the ability to use technologies in new ways and anticipate the effects they would have on them in the world of work.

Furthermore, the skills related to privacy and the protection of personal data are very important for students, particularly, business education students of tertiary institutions. Research in the field of privacy has determined a trend that is particularly present in social networking sites (SNSs), where the responsibility is pushed towards the user (De Wolf, Heyman, & Pierson, 2013). In this context, it becomes instrumental for individuals to understand the way their data and personal information is being shared, accessed by others, or used by governments and corporations; and, more importantly, they need to have the necessary skills to protect themselves from disclosing information they may not need, or want to: "it is crucial that users understand that those sites (without the appropriate privacy settings and critical skills) can lead to loss of control of personal data, and to having it delivered to third parties for commercial purposes" (Ala-Mutka, 2011).

Conclusion

Technology has frequently played a dominant role in defining what skills have been considered important. This is because new technologies continue to emerge at an exponential rapidity, replacing the older one as soon as they are adopted, and rendering former skills obsolete. With the diffusion of Information and communication technologies, new work environments continue to emerge, requiring additional skills to complement those of earlier technologies which are now known as digital skills.

The acquisition of digital skills by business education students in tertiary institutions in Nigeria is fundamental in this 21st century and beyond. This is so because the use of digital systems and tools, software applications and application of security measures in a digital environment is what would make the business education graduate perform ultimately well in the world of work after graduation. It is imperative, therefore, that business education students in tertiary institutions should be adequately exposed to the acquisition of these skills through a robust and enriched curriculum content as a framework.

Recommendations

The following recommendations were made from this study:

1. The framework for the acquisition of digital skills with emphasis on the use of digital systems and tools, software applications and application of security measures in a digital environment should be adopted by all tertiary institutions.
2. The three levels of skills clusters identified in this study should be embedded into the curriculum of business education programme in tertiary institutions.
3. Lecturers of business education should acquaint themselves on application of digital skills for effective delivery of the skills to students.
4. Professional development on digital skills acquisition is encouraged by all practitioners of business education programme.
5. A course on digital skills acquisition should be introduced to final year students offering business education in all tertiary education institutions in order for them to fit into the digital workplace environment after graduation.

References

Ala-Mutka, K. (2011). *Mapping Digital Competence: Towards a Conceptual Understanding* (Technical Note No. JRC67075-2011). European Commission Joint Research Centre, Institute for Prospective Technological Studies.



- Centiport. (2008). *IC³ 2005 Standard-Computing Fundamentals*. Retrieved from http://www.certiport.com/portal/common/pagelibrary/TestObjectives_IC3Computing2005ENU.htm
- Chinien, C., Boutin, F., & Chinien, A. (2011). *Learning to learn workbook: Developing analytical skills*. Retrieved from WDM Consultants: <http://www.wdm-consultants.com/>
- Chinien, C. & Boutin, F. (2012). *Defining essential digital skills in the Canadian workplace*: Final Report. WDM-Consultants.
- De Wolf, R., Heyman, R., & Pierson, J. (2013). Privacy by Design through a Social Requirements Analysis of Social Network Sites from a User Perspective. In S. Gutwirth, R. Leenes, P. de Hert, & Y. Poulet (Eds.), *European Data Protection: Coming of Age* (pp. 241-265). Springer Netherlands. https://doi.org/10.1007/978-94-007-5444-1_14
- Dede, C. (2010). Comparing frameworks for 21st century skills. In J. Bellanca & R. Brandt (Eds.), *21st Century Skills: Rethinking How Students Learn* (pp. 51-75). Bloomington, IN: Solution Tree Pre E-skills UK Sector Council. (2009). *e-skill UK: Strategic skills assessment for the digital economy*. London: Retrieved from http://www.oph.fi/download/141906_asset_14618.pdf
- Enang, C. E. & Okute, A. L. (2019). Leveraging on new technologies for skills acquisition of business education students in tertiary institutions in Nigeria for the e-world. *Nigerian Journal of Business Education*, 6 (1), 331 – 330. Retrieved from www.nigjbed.com.ng.
- FGN (2013). *National Policy on Education* 6th Edition, Yaba, Lagos: NERDC Press.
- Helsper, E. J., & Eynon, R. (2013). Pathways to digital literacy and engagement. *European Journal of Communication*, 28(6).
- Helsper, E. J., & Reisdorf, B. C. (2016). *The emergence of a "digital underclass" in Great Britain and Sweden: Changing reasons for digital exclusion*. New Media & Society .<https://doi.org/10.1177/1075547016666666>
- Inyang, U. G. & Ekpenyong, M. E. (2012). Computer software: In Udosen, E. D. Joshua, E. E. & Inyang, U. G. (Eds.). *Fundamentals of Science and Computing*. Uyo: Chf Prints.
- lordache, C., Baelden, D., & Mariën, I. (2016). Reconsidering digital skills: A theoretical questioning of the skills that define e-inclusion. <https://doi.org/10.1016/j.chbs.2016.08.001>
- lordache, C., Mariën, I., & Baelden, D. (2017). Developing Digital Skills and Competences: A Quick Scan Analysis of 13 Digital Literacy Models. *Italian Journal of Sociology of Education*, 9(1), 6-30. doi: 10.14658/pupj-ijse-2017-1-2
- Jenkins, H. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge: MIT Press.
- Lankshear, C., & Knobel, M. (2008). *Digital literacies: Concepts, policies and practices*. New York; Oxford: Peter Lang.
- Mariën, I. (2016). *De Dichotomie van de Digitale Kloof Doorprikt: Een Onderzoek naar de Oorzaken van Digitale Uitsluiting en naar Strategieën voor een Duurzaam e-Inclusiebeleid* (Unpublished dissertation). Department of Communication Sciences, Vrije Universiteit Brussel.
- Martin, A. (2008). Digital literacy and the "digital society." In M. K. Colin Lankshear (Ed.), *Digital literacy's: Concepts, policies and practice* (pp. 166-167). New York: Peter Lang
- Martin, A., & Madigan, D. (Eds.). (2006). *Digital literacies for learning*. London: Facet.
- O'Brien, J. A. & Marakas, G. M. (2008). *Management information system*. New York: McGraw-Hill Irwin.
- Okute, A. L. & Agomuo, E. E. (2014). Electronic learning and business education in tertiary institutions in Nigeria: Issues of adoption and adaptation. *Computer Education research Journal*, 1 (1), 101 – 107.
- Organization for Economic Cooperation and Development - OECD (2018). *Putting a face behind the jobs at risk of automation*, Policy Brief on the Future of Work, OECD Publishing, Paris.
- Rushkoff, D. (2010). *Program or Be Programmed*. Berkeley, CA: Soft Skill Press.
- Smith, J., & Anderson, L. (2010). *Scoping study: Identifying digital literacy skills*. Melbourne: Innovation and Business Skills Australia.
- Thomas J (2019). *Digital skills Where universities matter*. Brussels, EUA. Retrieved from: <https://eua.eu/downloads/publications/digital%20skills%20%20where%20universities%20matter.pdf>
- Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. San Francisco: Jos.
- UNESCO (2014). *Shaping the Education for Tomorrow*, 2012 Report on the UN Decade of Education for Sustainable Development, retrieved from <https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=919&menu=1515>.
- VanDeursen, A., & Van Dijk, J. (2014). The digital divide shifts to differences in usage. *New Media & Society*, 16(3), 507–526.
- VanDeursen, A., Helsper, E. J., & Eynon, R. (2014). *Measuring*