DEVELOPING TEACHER'S DIGITAL COMPETENCIES IN HIGHER EDUCATION: THE INFORMAL APPROACHES

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Abstract

The multiplication of technologies is modifying higher education delivery in the current digital revolution age and the experiences in the COVID-19 pandemic, making integrating technology into sustainable education contexts a necessity in the global community. Consequently, most universities in Nigeria and other developing countries are putting measures in place to achieve online/blended teaching. And the acquisition of requisite digital competencies amidst challenges of access to adequate internet bandwidth, cost of data, and technological devices became a burden for teachers. This paper presents an overview of teachers' digital competencies (TDC) that are relevant to higher education delivery. The paper argues that sound knowledge of the TDC would enable a motivated teacher to engage in self-directed development of TDC in addition to institutional provisions for in-service training. The efficacy of informal approaches like self-directed and collaborative learning by higher education teachers in accelerating the development of TDC is discussed. Some guidelines for self-development of TDC, in addition to practical tips on the acquisition of TDC amidst the challenges in the environment of developing countries with inadequate virtual orientation, are outlined.

Keywords: Higher education; digital competence; digital revolution; teachers' digital competence, online teaching/learning.

Introduction

The pivot of all human activities, including education, is currently influenced by the digital revolution. The digital revolution (also known as the third industrial revolution) encompasses the advancement of technology from analogue electronic and mechanical devices to available digital technology (Technopedia, 2017). It originated from the emergence of Information and Communication Technology (ICT) and became orchestrated by the ideas of the internet and the production of a variety of mobile communication devices. The digital revolution has influenced transformation trends in education, which manifest in enhanced access to education, flexible and personalized learning approaches, cloud-based learning opportunities, and use of the internet in schools, among others (Berguerand, n.d.). The influence of the digital revolution, with ICT in education delivery, became prominent when in-person classes were disrupted due to the Covid-19 pandemic. The resort to online teaching/learning, as a global response to the disruption, exposed the dire need for all teachers to be digitally competent in this era. In this vein, the United Nations Educational, Scientific and Cultural Organization Institute for Information Technology in Education (UNESCO-IITE) launched a high-level forum on teacher competencies in the digital revolution termed "reaching the unreached" (UNESCO, 2021a). The digital revolution has brought another essential component of teachers' competencies (Teachers' Digital Competence, TDC) to the limelight.

Competence comprises knowledge, skills, judgement, strength, and attitudes toward a particular duty or respect (Miriam-Webster, 2022). Digital competence is an emerging concept that includes technical skills to use digital technology, abilities to use digital technology in meaningful ways for working, studying, and everyday life in general, in various activities, and a motivation to participate in digital culture (Ilomaki et al., 2011). It is akin to the existing technology-related skills such as ICT skills, technology skills, 21st-century skills, information literacy, digital literacy, digital skills, and computer literacy. Digital competence is considered one of the eight 21st-century essential competencies for learners: emotional intelligence,

entrepreneurship, global citizenship, curiosity, cognitive flexibility, assessing and analyzing information, and self-knowledge (Hawking, n.d.). As a result of globalization, 21st-century skills are conceived for successful living and thriving in contemporary society. Generally, they comprise skills, abilities, and learning dispositions identified as being required for success in the 21st-century society and workplace by educators, business leaders, academics, and government agencies. Educators have become aware of the necessity for acquiring digital competence and using it to promote learning at all levels of education. This implies that in the educational context, teachers should possess the knowledge, skills, and attitudes required to use technologies to inspire learning effectively. The increasing prominence of digital competence in education is repositioning pedagogical practices in higher institutions, especially in Low- and Middle-Income Countries (LMIC), like Nigeria, from in-person or face-to-face (F2F) classroom teaching to fully online or at the least blended teaching. Consequently, there is an increasing interest in knowing and growing the digital competencies of higher education teachers (Basilotta-Gomez-Pablos et al., 2022).

The rapidly growing globalization today has influenced the enhancement of teaching and learning by competencies approach to flow with the exponential creation of information in all fields. To adapt to the constantly changing ICT and the demand for flexibility in learning through distant teaching and learning, especially in higher education, teachers must update to be digitally competent. Before the COVID-19 pandemic, the developed nations prioritized the development of digital literacy from the lowest levels of education as an instrument of economic growth (Hadziristic, 2019). While, developing countries, like Nigeria, are faced with a huge digital skills gap which is also hindering economic growth (World-Economic Forum (WEFORUM, 2020). Presently jobs and economic growth are linked to the digital literacy of individuals and nations. The COVID-19 pandemic forced every nation to employ digital competence to effect emergency remote teaching (ERT). While developed countries like China launched massive online education to combat the pandemic at all levels of education (Australian Government, 2020), developing nations like Nigeria experienced difficult and ineffective ERT even in higher institutions (Egielewa et al., 2021). Digital literacy is another index for categorizing the world's nations into developed or underdeveloped in this 21st century, resulting in a digital divide or gap between countries.

This current focus of education delivery on the global scene is the Education for Sustainable Development (ESD) which should empower learners to acquire skills, knowledge, and attitudes to address global challenges like inequality (UNESCO, 2021b). Gender inequality and the digital divide are existing forms of equality. ESD, as a key enabler of all Sustainable Development Goals (SDGs), emphasizes the view of learning as an instrument of finding solutions for myriads of challenges affecting humanity today and in the future. Teaching that will make learners solution providers in the 21st century must be innovative and requires digital competence. The Nigerian scenario portrays the nation as occupying a position in the range of the highest illiteracy in the world. Data from the UNESCO Institute for Statistics in 2017 showed that 40% of the adult population could not read and write, while 27% of youth between ages 15 and 24 are illiterates (UNESCO, 2017). There are two major problems of poor access to and poor quality of education offered in Nigeria. UNESCO (2017) mounted a successful project to assist the country in improving the quality of teaching of the English Language using mobile technology at the secondary school level. The project results indicated the potential of teachers' digital competence to enhance learning and improve the quality of education delivered in the country. The statistics in Table 1 depict the current poor access to higher education.

Table 1

Percentage of JAMB candidates (UTME) offered admission into the universities in the 2020/2021 session.

S/N	Range of scores in UTME	Number of candidates	Number of candidates admitted	%	Number not admitted	%

1	300 and above	4,948	3,492	70.6	1,456	29.4
2	250 – 299	52,323	29,143	56.8	22.580	43.2
3	200 – 249	347,496	153,835	44.3	193,661	55.7

Source: Premium Times (August 31, 2021).

Some of the reasons for failure to secure admission are the non-acceptance of offers into courses that were not applied for and the lack of credit passes required for some courses (Ebuka, 2021), which can be effectively addressed using distance learning/education. Distance education, which is currently gaining prominence in Nigerian higher education, requires teachers' digital competence to be implemented. It can be used to improve the quality of learning, thereby improving candidates' grades in the English Language as obtained in the UNESCO (2017) project, and to increase access to university education by providing online courses beyond the institution's walls of lecture rooms. This paper addressed the capacity building of lecturers in their digital competencies in the context of the environment of a developing nation. It included the contextual meaning of competency, digital competence, teachers' digital competence (TDC), practical, informal approaches to developing TDC amidst foreseen challenges, and relevant digital tools for the higher education level.

Competency, digital competence, and teacher's digital competence

Competency is the ability to perform a task successfully using relevant knowledge, skills, and attitudes in any field of work (Grosselin, 2020). Generally, competencies are measurable and explicit skills, knowledge, and values that people employ to perform successfully in various professions, education, and other life contexts (Grosselin, 2020). When applied to the teaching profession, competencies enable student learning achievement and support professional development and curricular studies (Selvi, 2010). They include the dimension of ICT or digital competencies in the contemporary education system, as explained earlier.

The digital competence of the teacher, termed Teachers' Digital Competence (TDC), enables the teacher to successfully integrate and use technologies in a pedagogical way (Ilomaki et al., 2011). This simply implies that teachers should possess enough technical knowledge to use digital technologies in their professional activities. Hence, TDC defines the knowledge, skills, and attitudes teachers must have to effectively integrate ICT from technological, multimedia, communicative, informational, ethical, and collaborative aspects, into their professional practices, both within and outside the formal school system (Ilomaki et al., 2011).

Although the literature shows that many studies focused on TDC at lower educational levels, the COVID-19 pandemic era has ushered in a growing interest in the development and assessment of TDC at the university level. In this vein, Amhag et al. (2019) found that teacher educators did not use digital tools for pedagogical purposes in their study of digital tools in higher education in Sweden. They recommended extensive pedagogical support for the teacher educators to create digital teaching. From their literature review, Basilotta-Gomez-Pablos et al. (2022) found that higher education teachers' self-assessment of their digital competencies indicated low, medium, and the absence of certain competencies. They recommended more practical and personalized training programs that meet the needs of higher education teachers in the digital era. The situation in developing nations' higher education cannot be better than that in the more developed countries like Sweden and Spain, used for the respective studies cited earlier (Amhag et al., 2019; Basilotta-Gomoez-Pablos et al., 2022). This paper presents some practical and personal techniques for achieving TDC among higher education lecturers, as support for effective digital teaching.

Ways to enhance teachers' digital competence

Three levels of roles influence the development of teachers' digital competence.

- **The policy level:** This level involves a nation's responsibility, through her ministry for education, to provide guidelines or framework for the digital competence of teachers that are appropriate for achieving the goals of her educational policy. The national frameworks could be derived from internationally recognized ones like "A Global framework to Measure Digital Literacy" presented at the World Summit on the Information Society in Geneva in 2018 (UNESCO, 2018), training on "Digital Competencies and Skills" conducted by UNESCO (2022); "European Framework of Digital Competence for Educators, (Dig Comp Edu)". European Commission (2017) and "UNESCO ICT Competency framework for teachers" (Cabero-Almenara,2020). Some other national frameworks include the "Common Digital Competence Framework for Teachers" in Spain; the "Digital Competency Framework" of Quebec in Canada (Ministry of Education and Higher Education, Quebec, 2019); "British framework of digital teaching"; "Competencies for the professional development of Colombian teachers" and "ICT competencies and standards for Chilean teachers" (Cabero-Almenara, 2020).
- **The institutional level:** Institutions, especially higher education, are also interested in improving the digital competence of their teachers. Consequently, they could adopt or adapt recognized and approved frameworks into their respective learning management systems (LMS) and use same to provide in-service training through workshops and webinars to their teachers. Through these formal training approaches, teachers' digital competencies could be developed. Some general LMS platforms like MOODLE (Modular Object-Oriented Dynamic Learning Environment) and Canvas are used in several higher institutions.
- **Personal Level:** At the personal level, an individual lecturer, through intrinsic motivation and commitment to lifelong learning, develops their digital competence concerning approved/recognized national and international frameworks and institutional LMS. The acquisition of TDC by lecturers who were not trained in their early teacher education period in the practice of digital teaching requires great attitudinal change and an openness to embrace the new skills. This provides a driving force that enables personal development of TDC, as it is an antithesis to apathy to change to the digital modes of teaching, which is commonly observed among experienced "F2F" lecturers. Although the apathy results from frustrations and unmet challenges of digital teaching in the environment of institutions in developing nations with poor virtual orientation, it does not counteract the absolute necessity of being digitally competent as a 21st-century teacher. Tusiime et al. (2019) found that Arts and Design teacher educators in Uganda developed their TDC through formal and informal approaches like self-teaching and collaboration. Hence, this paper focuses on the effective personal development of TDC by higher education teachers in contemporary environments through informal approaches. Effective self-directed learning, as an informal approach, is achieved by establishing profound readiness to acquire necessary skills and knowledge, identifying resources for the competencies, engaging in the learning activities, and self-evaluating the learning progress. Therefore, for effective self-development of their digital skills, higher education teachers should be fully acquainted with the required competencies for actualizing digital teaching

An Overview of Teachers' Digital Competencies for Higher Education

The existing frameworks have outlined the TDC required for the effective delivery of digital teaching in higher education. A widely acclaimed framework is the Spanish common digital competence framework for teachers (Cabero-Almenara et al., 2020). The major areas of TDC identified in existing frameworks include the following: Information and data competencies, Digital communication and collaboration competencies, Digital content creating

competencies, Digital problem-solving competencies, and Competencies for maintaining digital safety.

A higher education teacher who has acquired a significant level of proficiency in each of these major competencies should be able to plan, manage, and implement digital teaching and learning. These include using technology to interact with learners individually or as a group, during and outside learning periods, giving feedback after formative and summative assessments, using digital assessment formats, and generating overall evidence of their performances in the digital teaching/learning process. Digitally competent teachers should be able to employ technology for their professional development, engagements, and growth in addition to the selection, creation, management, and sharing of digital resources in the wider community beyond the institutions. Table 2 outlines the TDC and the digital activities/tools and practices relevant for higher education teachers to enhance their digital competencies.

Table 2:

An overview of teachers' digital competencies (TDC) and associated digital skills and practices

S/N	TDC	Digital skills	Practices
1	To find, get, save, arrange and interpret digital information relevant for teaching purposes	Search and find relevant online information on the internet. Use web browsers like Google Chrome, Microsoft Edge, UC browser, Mozilla Firefox, Opera	Browse the internet to locate educational websites, using smartphones/i-pad/laptop/ computers
2	Check the authenticity of digital content in efficient ways	Check accuracy, usefulness, and adequacy of digital information for teaching purposes	Check licenses. Compare sources of information from the websites. Use a variety of search engines.
3	Arrange and save data for easy retrieval	Save data in ICT devices and with cloud storage	Create files for local and online storage. Save and retrieve files.
4	To use a variety of digital applications to communicate online and convey learning activities to students	Use digital tools like email, SMS, video, and audio messaging apps, create groups for communication	Type SMS texts, write email messages, record video and audio messages, create groups using WhatsApp, telegram, etc.
5	To share digital information	Disseminate relevant information on social networks, groups, and learners	Post text/audio/video messages/information to individuals/groups.
6	Engage with society through online platforms.	Use existing online services for teaching, applications, administration, purchases	Fill out forms and send articles online
7	Use digital technology to collaborate in educational activities	Participate in webinars, videoconferences, online discussions, and chats	Host and join meetings in Zoom, Google Meet, Google classroom, Adobe connect, Skype meet now, WhatsApp chats, video calls, etc.
8	Maintain standards and etiquettes (or netiquette) in online interactions	Behave appropriately in digital communication, know, and respect the rules to accommodate the diversity of online users.	Read and be informed on cyber-bullying and abuses to avoid.

9	Create and manage digital identities	Create different accounts, and use various digital channels with protected digital self-image.	Create accounts with Google, Facebook, online banking, Twitter, LinkedIn, etc., with usernames and passwords.
10	Create digital content and resources	Produce educational resources (lecture notes, video or audio, course outlines, assignments, and tests) in digital formats.	Use multimedia to produce appropriate teaching resources, videos, podcasts, and power-point.
11	Modify and integrate existing content for use	Create modified and improved digital resources that are suitable for teaching objectives	Use multimedia to combine, separate, and re-design educational (texts, audio, video, images) materials.
12	Apply copyright and license to digital content creation	Use open and privately licensed content appropriately, legally	Learn about licenses and copyright in digital communication
13	Perform suitable digital formative and summative assessment	Use digital technology to assess learners at formative and summative levels	Select/design and use computer-assisted tests and examination questions in your course.
14	Analyze and interpret evidence of learning digitally	Use digital assessment tools/apps to score and interpret learners' performances	Select/design and use appropriate digital scoring tools/apps (like showbie, Edmodo, zip grade, etc.).
15	Provide timely feedback using digital technology for decision making	Send targeted feedback to all stakeholders, parents, learners, and school authorities online	Select/design and use relevant formats (like Google jamboard, flipgrid, padlet, etc for feedback) and ones in LMS for disseminating results of assessment digitally
16	Operate digital devices in a teaching process	Organize digital teaching using appropriate tools	Teach online synchronously/asynchronously or in hybrid mode using Zoom, Google meet, Microsoft Teams, recorded audio lectures, Google docs, etc.
17	Respond to learners' constraints in their use of digital technology	Prepare to assist learners in fixing their digital challenges	Identify common problems in the use of ICT devices and their solutions
18	Foster learners' active engagement, collaboration, and guidance	Create learners' groups and projects and arrange for interaction with individual students online	Implement and monitor students' group assignments/projects and individual activities and hold virtual interactive sessions with groups and individuals
19	To implement continuous professional development (CPD) using digital resources	Register for online courses Attend webinars, and video conferences relevant to your field of specialization	Select and complete relevant online courses (like the free Facilitating Online course of emergeafrica.net) Identify, register, attend, and present papers in online webinars and conferences.

20	Implement safety rules in the use of digital technology	Ensure the well-being of the learners and everyone in the environment/community in the safe use of digital technology	Learn the misuse of ICT devices, screen time and radiation, energy and data saving, and storage of devices to avoid risks
21	Protect digital content and personal ICT devices	Obtain information on managing the safety of devices and stored data, through updating, and relevant installations	Install antivirus, update ICT devices, charge the device's battery, and use passwords to control access to data.
22	To influence teaching, learning, and research digitally	Teach with digital text, audio, and video documents. Enhance learning using digital tools to express empathy for individual differences and constraints. Collate educational resources from the web for teaching and research	Use MS Office, multimedia, download and upload information, save and retrieve documents, and use a variety of digital devices and communication applications (e.g., social media) and networks to obtain and manage data for teaching and research

An effective informal approach to becoming digitally competent

As stated earlier, self-directed learning is an effective informal approach. Generally, learning is a life-long endeavour. The same applies to digital learning. Since digital literacy enhances personalized, flexible learning, acquisition of digital competencies is achieved easily through a personalized informal learning approach of self-directed learning. The following guidelines and steps could help higher education teachers acquire and enhance their digital teaching competencies in a self-directed learning approach.

- Obtain personal ICT devices such as smartphones, laptops, tablets, and desktop computers; and establish a reliable source of data, internet connection, and power supply.
- Get a list of the required TDC (see Table 2) from acceptable frameworks or your institution's LMS.
- Leverage on personal previous digital skills (despite the level), and start from the basics such as learning how to use personal ICT devices from their manuals for the performance of entry-level digital skills like word-processing, email (receiving and sending, using attachments, chat (on social media platforms)) and engaging in text, audio, and video messaging with others.
- Connect to the internet using a web browser to access, assess and store information. From this point, it is possible to take free online courses to practice and acquire other competencies. There are a variety of online tutorials which offer training on all digital skills.
- It is necessary to continue to improve the methods of communicating with others online by signing up to many accounts such as Zoom, Skype (or Meet-Now), Facebook, LinkedIn, yahoo mail, Gmail, Twitter, and Instagram.
- Use any digital skill learned consistently in interacting with others as a hobby and devoting time to be online since practice makes one perfect.
- Practice any digital skill learned effectively, especially by teaching the skill to others.
- Take advantage of free online courses to practice using search engines, fill out online forms, find solutions to digital problems (through frequently asked questions, FAQs),

safe and legal use of online data, data storage and sharing, creating and securing passwords and antivirus precautions.

These steps could guarantee the acquisition of basic digital skills required in a day-to-day teaching or personal context.

However, there exist common challenges of poor internet (weak broadband signal), unstable/unavailable power supply, and high cost of data and ICT devices in developing countries, which adversely affect the convenient acquisition of digital competencies. Developing countries like Nigeria are plagued with the occupation of the positions of low virtual orientation in the digital divide from global assessment (Shenglin et al., 2020), which can only be adequately remedied at the level of governments' efforts. Hence, suggestions for overcoming these challenges at a personal level in the informal approach are as follows.

Practical tips on meeting the challenges to the acquisition of digital competence in an informal approach

- Subscribe to the mobile/SIM networks among these popular ones – MTN, Globacom, Airtel, and 9mobile which offer the strongest internet service in any location for browsing/online purposes
- Obtain and use the information on their data plans, cost, bonuses, social media bundles, mobile Wi-Fi stability, and flexibility in any location.
- Subscribe to very strong (in terms of broadband internet speed) internet service providers located mainly in the cities such as Smile, Tizeti, Cobranet, SWIFT, Spectranet, KknotTech, and ipNX, if it is convenient to do so.
- Subscribe to internet service providers (ISP) like Cobranet, Spectranet and Tizeti that offer unlimited data access to homes and offices.
- Obtain robust and high-speed computers/laptops and install many web browsers like Google Chrome, Internet Explorer, Mozilla Firefox, Microsoft Edge, Opera, and UC Browser to use their respective advantages.
- Source for stable power supply like solar- and inverter power systems in addition to the myriads of individual and house electricity generating sources being used in the environment.
- Mobile and ICT devices could be obtained at a lower cost and in more financially convenient ways through group purchases (like through co-operative societies).
- Brynildsen & Haugsbakken (2020) found that using partnerships among professional teachers was useful in developing their digital skills. Hence, higher education teachers can partner in small cohesive groups (like research groups) to share data, and energy (to cut down costs), engage in planned collaborative learning of digital skills and practice digital teaching through peer teaching as an additional informal approach.
- Self-evaluation of the level of digital competence acquired could be carried out by selecting and using appropriate available online instruments for assessing TDC. Some of the numerous self-assessment online instruments are as follows.
    1. Digital competences self-assessment grid (European Union,2015):
    2. Digital skills accelerator self-assessment tool. (Misheva,2021):
    3. Digital competence test. (Mirigliano,2021).
    4. Adapted self-assessment instrument for educators' digital competence. (Cebi & Reisoglu ,2022).

Conclusion

Though most universities in Nigeria and other developing countries are putting measures in place to achieve online/blended teaching/learning following the COVID-19 pandemic and the digital revolution era, acquisition of the requisite digital competence, amidst challenges of access to high bandwidth internet, cost of data and ICT devices, is a burden for the teachers. While acknowledging the necessity and ubiquity of digital competence in

contemporary society and especially the need to embrace the change in higher education, there is an urgent need to proffer knowledge and counsel on how the challenges can be overcome. It is expected that the use of informal approaches like self-directed and collaborative learning in the practical ways presented in this paper will enhance the development of the teachers' digital competencies in higher education.

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PREPARATION OF BUSINESS EDUCATION TEACHERS FOR EFFECTIVENESS IN TERTIARY INSTITUTIONS IN NIGERIA AND ITS CHALLENGES.

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Abstract

The paper examined the Preparation of Business Education Teachers for effectiveness in Tertiary Institutions in Nigeria and its challenges. Business teacher education is regarded as the policies and procedures designed to equip prospective business teachers with the knowledge, attitude and skills required to perform their tasks effectively well in the classroom and work environment. It is the quality of the services of the universities, polytechnics and colleges of education that make the business education teachers more proficient in producing students and professionals with broad knowledge and varied skills that will make them employable in the technology-driven society of the 21st century. The challenges encountered by tertiary institutions running business teacher education programmes were highlighted. The paper recommends as follows: that business teachers should embark on continuous professional development to keep up-to-date with modern information technology gadgets that would aid teaching and learning; that training and retraining of business education teachers need to be continuous and target-oriented; that the management of Tertiary Institutions should provide facilities to enable business education teachers and their students have uninterrupted access to information and that universities offering business education programmes need to restructure its programmes to ensure that business education graduates acquire sufficient content knowledge and firsthand experience both in the diverse areas of business and the methodology of teaching business. And a conclusion is drawn.

Keywords: Education, Teacher Education, Business Teacher Education.

Introduction

Business education plays a prominent role in preparing the student. They become responsible citizens capable of making important economic decisions that will benefit their personal and professional lives. The Policies Commission for Business and Economic Education (1999, 1998, 1997) stated that business education represents a broad and diverse field of study that is included in all types of the educational delivery system, elementary and secondary schools, one and two-year schools, community colleges and four-year colleges and universities.

Business education can commence at any stage, be stopped for varying lengths of time, and most likely continue throughout one's life. Administrative assistance, marketing and sales vocations, information technology occupations, business teaching, business administration, and economic knowledge are all covered by business education. Business courses are often electives for students in high school.

Business education, according to Ulinfun in Aliyu (2001), is education for business or training in business skills which is required for us in business offices, clerical occupations and policy analysis. He noted that business education is the deliberate intent of teachers to inform students about economic and business concepts and skills that might be useful in later life. Business Education is also meant to equip the youths with certain financial and business concepts as a vehicle for a better understanding of the dynamic business world. According to Etonyeaku (2009), business education is a strong force that will provide individuals with the necessary skills, information, talents, and competencies to empower them to become self-employed and self-reliant, resulting in long-term economic development.

Business Education being a skill-oriented Programme, will expose the students and individuals to technologies that are necessary for managing business and how to use the information and services in the business world.