

# Digital competencies and the 21<sup>st</sup> century skills of university teachers in Nigeria

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## ABSTRACT

The study examined university teachers' digital literacy in Nigeria's south-south geopolitical region. The descriptive survey approach was used, and three research questions served as the study's direction. Data were gathered via an online questionnaire. SPSS version 23 was used to calculate the mean and standard deviation after frequency counts and simple percentages were used to evaluate the data while the independent t-test was used to test the hypothesis. The online survey was distributed to 200 faculty members, and 91 of them fill it out, yielding a 46% response rate. The sample for the study consisted of 91 lecturers who answered the online survey. Two measurement and evaluation specialists and two experts in digital technology evaluated the questionnaire. Cronbach's alpha was employed to determine the instrument's dependability, and the result was 0.74. The results showed that university lecturers possess high levels of both fundamental and multidimensional digital competence. The survey found that among the difficulties experienced by university teachers in acquiring digital skills were a lack of opportunity for information and communication technology (ICT) training, the high cost of ICT literacy training, inadequate ICT facilities, and a lack of sponsorship. Lastly, the outcome of the hypothesis test indicates that there is no statistically substantial difference in the levels of digital competence between male and female university lecturers. Based on their findings, the researchers suggested that university administrators set up digital skills training for university faculty members as well as assistance and incentives to promote development of digital abilities. The government should be dedicated to education overall by investing adequate finances for teacher training, infrastructural development, and enhanced welfare programs to deliver excellent university education in this digital era.

**Keywords:** digital competence, university teachers, south-south, Nigeria

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## INTRODUCTION

COVID-19 had several ramifications for most countries around the world, including Nigeria. These repercussions included the closure of schools and businesses as well as travel restrictions (Wagwu et al., 2022). Students left their respective institutions as all educational activities abruptly came to an end, upsetting academic calendars around the world (Ifijeh & Yusuf, 2020). Due to this circumstance, several schools were obliged to switch from traditional to online learning. Online learning suddenly emerged as the ideal method for delivering course materials, engaging students, and carrying out assessments (Mukhtar et al., 2020). Aside from the unspeakable suffering the pandemic caused, it also contributed to a redefining of the educational sector's functionality. The significance of digital technology and digital competency has also been elevated in the process of educational change (Olofsson et al., 2021). Given this reality, digital competence has recently garnered focus in the instructional context and is now

recognized as one of the essential skills that instructors in today's society need to possess (Basilotta-Gómez-Pablos et al., 2022; Tejada & Pozos, 2018).

Digital competencies refer to the skills, understanding, and outlooks required to proficiently utilize digital tools for communication, problem-solving, and information management. It encompasses the ability to interact with digital technologies confidently, critically, and responsibly in various contexts, such as education, employment, and social engagement (European Commission, 2018). These competencies involve a range of skills, including digital literacy, digital communication, digital collaboration, digital creativity, and digital citizenship. In today's increasingly digital world, digital competencies are becoming essential for individuals to participate fully in society and succeed in the workplace.

According to Rajab et al. (2020), the COVID-19 epidemic has sped up the integrating digital know-how into teaching strategies and is now posing the question of the digital competency of higher education

teachers (Noskova et al., 2021). Digital technology has demonstrated its importance by enabling some degree of continuity in life and education. In addition to what they have mastered themselves, Redecker and Punie (2017) contend that the teacher must enable students to acquire their technological capabilities. They emphasize that to be a proficient digital teacher, one must be able to assist students in becoming digitally competent, which unquestionably raises the stakes for reluctant teachers who are unwilling to devote time to developing these skills. Technology proficiency is essential for university teachers to be adequately equipped for the demands and problems of today's society (Voogt et al., 2013). This implies that educators must possess strong digital skills that enable pedagogically sound technology integration and utilization. A teacher who has strong digital skills may share and monitor knowledge utilizing a variety of digital tools and applications with students.

Owing to the COVID-19 disruption, the majority of academic faculty members at all levels were forced to quickly adapt their teaching methods, subject matter, and instructional materials to transition to online teaching at an unparalleled ratio (Manco-Chavez et al., 2020). However, some teachers had trouble adjusting to digital pedagogy and e-learning, and collaboration abilities, and adopting new strategies for evaluating, imparting knowledge, and collaborating on the internet (König et al., 2020; Lāma & Lāma, 2020). This can be a result of university teachers' general ignorance of the fundamental information and communication technology (ICT) components, especially in Nigeria, where university teachers are used to face-to-face instruction and lack access to adequate ICT facilities for online teaching. The hurdles to using digital technology in Nigeria were teachers' lack of expertise and confidence, instructors' unfavourable attitudes, and a lack of ICT workers (David-West, 2022; Nwoke, 2016). Although the partial usage of digital tools may be instructors' lack of technological know-how, the growing use of digital tools may raise teachers' perceptions of their technological know-how.

Sadly, face-to-face instruction is still the predominant modality of instruction at most Nigerian universities. However, the COVID-19 epidemic has forced them to adapt their educational procedures rapidly and urgently to stay current with those of the 21<sup>st</sup> century. University lecturers must develop their digital abilities to function effectively in the digital world and become engaged users of digital technologies (David-West, 2022). This will then be incorporated into the educational setting, resulting in learners who are digitally literate and appropriate for the digital age. Teachers are compelled to reconsider and modernize prior educational traditions as a result of technology, as digital tools become an integral component of daily work (Pettersson, 2018). These difficulties have put a lot of pressure on universities to come up with plans to help their lecturers gain the digital skills necessary for excellent teaching and learning. Universities in Nigeria must unquestionably advance in the creation of the digital competence of their teaching staff couple with the introduction of technology into their classrooms as a means of contact and information access. Digital technology adoption and utilization in teaching and learning practices depend on teachers' digital competency; lecturers should therefore redefine and revise their professional roles to thrive in a changing environment and be successful in unpredictable circumstances (Amin, 2016). However, Basilotta-Gómez-Pablos et al. (2022) contend that there is still a deficiency of data on university teachers' digital competencies, particularly in underdeveloped nations like Nigeria. This enquiry fill this deficiency by probing the level of digital competencies

and the 21<sup>st</sup> century skills of university teachers in Nigeria. The work also seeks to proffer answers to the research questions, as follows:

**Research question 1:** What are the basic digital competence skills of university teachers?

**Research question 2:** What is the level of digital competencies of university teachers in various dimensions?

**Research question 3:** What are the difficulties encountered by university educators in obtaining digital skills?

## LITERATURE REVIEW

Research has been done on the digital proficiency and the 21<sup>st</sup> century skills of university lecturers. Some of the research in this field has produced contradictory findings. These studies can be split into two categories based on their conclusions. University lecturers own a high digital competency, according to the first group of studies. However, the second line of research indicates that university lecturers have low, medium-low, or intermediate levels of digital proficiency. In this section, a review of a few of these investigations is provided.

Noskova et al. (2021) used five focus groups with seven teachers each to study the digital proficiency of university teachers in Russian universities. The university lecturers possessed a high level of digital proficiency. Esteve-Mon et al. (2020) looked at the proficiency in digital teaching of university instructors at one Spanish and one Polish institution and discovered that the lecturers possess adequate technical proficiency. In another study, Kožuh et al. (2021) looked at the digital skills of science and technology teachers. The research showed that the teachers frequently applied digital tools while teaching. In Calabar, Nigeria, Mfon (2016) found that teachers had a moderate level of digital proficiency when using social networking sites. It is therefore possible to conclude here that university teachers are familiar with computers and the Internet and can connect with co-workers, students, etc., via diverse digital resources.

However, some studies have found that university teachers have low, medium-low, or intermediate digital competence. Basilotta-Gómez-Pablos et al. (2022) revealed that teachers have low or medium digital skills. Sánchez-Cruzado et al. (2021) did a study of 4,883 Spanish teachers on their digital literacy at all education levels. The result showed that teachers underrated their own tech proficiency. David-West's (2022) study of descriptive survey design on digital literacy skills among 26 library and information science (LIS) lecturers in universities in Rivers State, Nigeria, showed that LIS educators lack the knowledge and abilities to use online platforms for instruction without help. Sánchez-Caballé et al. (2022) findings indicated that the university teachers' degree of digital proficiency is intermediate. These studies show that teachers have low or in-between levels of digital proficiency and therefore require adequate training to update their digital skills.

Edeh et al. (2022) evaluated gender discrepancies in instructors' levels of digital literacy to support students with functional diversity. Eighty teachers from Southern states of Nigeria make up the study's sample. This study showed that teachers of both genders have certain digital literacy abilities that can help learners who have functional diversity. It was discovered that instructors' digital literacy abilities to support students with functional diversity are not significantly influenced by teachers' gender. Aside from the studies mentioned above, other research has shown that university teachers in developing

**Table 1.** DigCompEdu framework

Areas	Definition
Professional commitment	Proficiency with digital technologies for interaction, teamwork, and career growth
Digital resources	Digital material creation, searching, exchanging, and management
Teaching & learning	Digital technology management, organization, and application in the education and learning processes
Evaluation & feedback	Using digital tools and techniques to enhance the processes of evaluation and feedback.
Student empowerment	Improving inclusion, personalization, & engaged student participation in their learning through use of digital technologies
Development of students' digital competence	Enabling students to use digital tools for information, communication, content creation, wellbeing, and problem-solving in a creative and responsible manner

countries face difficulties in acquiring digital skills. Anunobi and Ukwoma (2016) mentioned that among the key barriers to raising the digital competence levels in Nigerian universities are poor infrastructure and the lack of adequate regular revisions of curricula to integrate new teaching methods and digital competence. Orshi (2016) indicated various challenges confronting Nigerian university teachers in acquiring digital skills. In addition, Anunobi and Ukwoma (2016) mentioned that among the key barriers to raising the digital competence levels in Nigerian universities are poor infrastructure and the lack of adequate regular revisions of curricula to integrate new teaching methods and digital competence.

However, several studies have pointed lack of teachers' approval of adding technology into teaching as the core challenge to the digital competence of university teachers (Howard, 2013; Somekh, 2008). This resistance may stem from several factors, including lack of training or support, concerns about the effectiveness of technology-based teaching, and a preference for traditional teaching methods. Additionally, some teachers may not fully understand the potential benefits of using technology in teaching or may feel overwhelmed by the constantly evolving landscape of digital technologies. To address these challenges, universities must offer more comprehensive guidance and backing for teachers to develop their digital competencies. This could include offering workshops, resources, and incentives to encourage its utilization.

## THEORETICAL FRAMEWORK

Joint Research Center's DigCompEdu theoretical frameworks serve as the foundation for this investigation (Redecker & Punie, 2017). Digital teaching competence is defined by DigCompEdu framework, as the sum of the six aspects listed in **Table 1**. DigCompEdu framework was chosen for this study because it is a standard for all of Europe and is sufficiently adaptable to be adjusted to different circumstances (Caena & Redecker, 2019). One of the driving forces behind this study is the observation made by Saubern et al. (2020) that even though there has been a lot of literature on the issue, more research in this area is still necessary.

## METHODOLOGY

A descriptive survey approach was employed in the study. The respondents comprised 200 university teachers in the south-south geographical zone of Nigeria who were sent an online questionnaire. A total of 91 teachers responded by filling out the questionnaire. 91 university teachers who responded to the online questionnaire were used as the sample for the study.

Google Forms online survey was developed by the researchers and was open for responses for three months. A research summary, the study's topic, its aim, and a guarantee of the confidentiality of the respondent's information were all offered in the questionnaire's introduction section and two other sections. Part A elicited information on the demographic features of the respondent, while part B consisted of three items (research questions) that were specifically created to gather information on the topic.

To determine how the items are arranged and whether they are consistent with the main goals of the study, the questionnaire underwent both face and content validity testing. Two experts in measurement, evaluation, and digital technology verified the instrument. The instrument's reliability was tested using Cronbach's alpha, and the outcome was 0.74. Based on the found coefficient, it was decided that the questionnaire was reliable.

SPSS version 23 was used to calculate the mean and standard deviation after frequency counts and straightforward percentages were used to evaluate the study's data. The questionnaire's responses were scored using a 4-point Likert-type scoring system and a numerical scale. The options available to the interviewees were strongly agree (SA)=4, agree (A)=3, disagree (D)=2, and strongly disagree (SD)=1. A criterion value of 2.5 was chosen on the scale. Following is how the criterion number was determined:  $\text{Criterion score} = (4+3+2+1)/4 = 2.5$ . Items with a mean value greater than the criterion score of 2.5 for research question 1 and research question 2 were measured to have high-level basic digital competence skills and high-level digital competence in various dimensions, while those below 2.5 were considered to have low-level basic digital competence skills and low-level digital competence in various dimensions. For research question 3, items with a mean number greater than the threshold of 2.5 were considered to agree, whereas those under 2.5 were considered to disagree. Descriptive statistics like frequency counts, sample percentages, and mean were used to assess the data.

## FINDINGS

### Research Question 1: What Are the Basic Digital Competence Skills of University Teachers?

The findings are shown in **Table 2**. **Table 2** shows the basic digital competence skills of university teachers. Every item in **Table 2** has a mean number that is higher than the criterion mean of 2.5, and the grand mean of 3.3 is even higher than 2.5. This shows that university teachers under study have high basic digital competence skills.

### Research Question 2: What Is the Level of Digital Competencies of University Teachers in Various Dimensions?

**Table 3** reveals the level of digital competencies of university teachers in various dimensions.

**Table 2.** Basic digital competence skills

S/N	Basic digital competence	Mean	Standard deviation
1.	Online communication skills (e-mail, telephone, instant message, SMS, etc.)	3.7	0.49
2.	Internet surfing/browsing	3.5	0.56
3.	Storing, copying, & retrieving data into a primary & secondary storage device	3.5	0.62
4.	Retrieving documents from e-databases/e-journals & websites	3.4	0.64
5.	Basic computing, e.g. Word processing, PowerPoint, Excel, etc.	3.4	0.55
6.	Search engines & search strategies	3.4	0.62
7.	Electronic resources	3.4	0.59
8.	Digitization, e.g., scanning, editing, and uploading	3.2	0.70
9.	Cloud storage devices, e.g., Dropbox	2.9	0.82
10.	Online publishers & publishing agency	2.9	0.57
11.	Critical thinking skills	2.9	0.57
<b>Grand mean</b>		<b>3.3</b>	<b>0.61</b>

**Table 3.** Level of digital competence

S/N	Level of digital competence by dimension	Mean	SD
1.	Professional commitment	3.4	0.59
2.	Digital resources	3.2	1.45
3.	Student empowerment	3.1	2.03
4.	Development of students' digital competence	3.1	0.74
5.	Teaching & learning	2.8	0.77
6.	Evaluation & feedback	2.7	0.76
<b>Grand mean</b>		<b>3.1</b>	<b>1.06</b>

Note. SD: Standard deviation

Every item in **Table 3** has a mean number that is higher than the criterion mean of 2.5, and the grand mean of 3.1 is even higher than 2.5. This shows that university teachers under study have high digital competence in various dimension.

### Research Question 3: What Are the Difficulties Encountered by University Educators in Obtaining Digital Skills?

**Table 4** details the difficulties university lecturers have in learning digital skills. All items in **Table 4** have mean values that are higher than the criterion mean of 2.5, and the grand mean of 3.4 is higher than the criterion mean of 2.5, indicating that all of the items in **Table 4** are difficulties university teachers encounter in acquiring digital skills. The most notable among challenges is lack of ICT training opportunities.

### Hypothesis: There Is No Significant Difference in the Level of Digital Competence of University Teachers by Gender

The gender differences in university instructors' levels of digital competency are shown in **Table 5**. The p-value in the chart is 0.267. The p-value exceeds the 0.05 alpha number when testing the hypothesis. Therefore, the null hypothesis is believed to be true. As a result, there is no statistically significant gender gap in the digital proficiency of university instructors.

## DISCUSSION

The analysis of the research was conducted in compliance with the parameters of DigCompEdu European paradigm and made use of a questionnaire developed in earlier research (Llopis et al., 2021;

**Table 4.** Challenges faced in obtaining digital skills

S/N	Challenges	Mean	SD
1.	Lack of ICT training opportunities	3.5	0.54
2.	Poor ICT facilities	3.3	0.61
3.	High cost of ICT literacy training	3.3	0.65
4.	Lack of sponsorship from my institution	3.3	0.58
<b>Grand mean</b>		<b>3.4</b>	<b>0.59</b>

Note. SD: Standard deviation

Redecker & Punie, 2017). Research questions one and two show that the university teachers under study have high degree of basic digital competence skills and high digital competence in various dimensions. This is a positive outcome because it shows that university teachers in Nigeria's south-south geopolitical zone are prepared to use digital technologies to transform teaching-learning processes and provide new learning opportunities in the 21<sup>st</sup> century society. This is particularly important as this era requires the digitization of teaching and learning processes, which has mandated university teachers to develop digital skills to respond to new challenges and demands in the teaching profession. The digitization of learning and teaching processes in the 21<sup>st</sup> century has made it necessary for university instructors to improve digital skills tailored to their field of expertise to meet new challenges and demands (UNESCO, 2013). Beyond the internal and external explanations for the adoption of digital technologies in higher education, according to Selwyn (2011), their use appears to have evolved into a standard and expected part of the curriculum. As a result, it has become imperative for developing nations to step up and keep up with the evolving trends. This study concurs with that of Noskova et al. (2021), who also found that university teachers had a high level of digital competence.

Research question three established that the challenges faced by Nigerian university teachers in obtaining digital skills include a lack of ICT training opportunities, a high cost of ICT literacy training, poor ICT facilities, and a lack of sponsorship from their institutions. This result implies that some obstacles stand in the way of Nigerian university teachers' acquisition of digital skills. This result makes a strong case for the need to address these areas so that more university teachers in Nigeria can acquire digital skills. More Nigerian university

**Table 5.** Independent sampled t-test statistics of difference in level of digital competence of librarians by gender

Gender	n	Mean	Standard deviation	t-value	df	p-value	Remarks
Male	57	106.1754	13.51074	1.323	89	0.267	Non-significant
Female	34	102.5882	10.61194				

Note. Cronbach's alpha=0.05

teachers need to have proper training on digital skills and how to effectively use digital technologies in the teaching and learning processes. This result conforms to that of Anunobi and Ukwoma (2016) and other studies that found some challenges in acquiring digital skills, especially among university teachers in developing countries. Finally, the findings of the hypothesis test shows no statistically substantial difference in the levels of digital competence between male and female university lecturers. This finding is consistent with that of Guillén-Gámez et al. (2021), who discovered no appreciable gender disparities in the level of digital competence of teaching personnel.

## CONCLUSIONS & RECOMMENDATIONS

The study looked at university lecturers in south-south Nigeria's digital proficiency. University teachers in this study have very high levels of fundamental digital competence skills and high levels of digital competence across multiple dimensions. However, university teachers had difficulties in learning digital skills due to a lack of ICT training opportunities, the high cost of ICT literacy training, inadequate ICT facilities, and a lack of institutional support. The researchers proposed based on their results that university administrators set up digital skill development courses for university faculty members as well as assistance and incentives to promote the acquisition of digital abilities. The government should be dedicated to education in general by investing adequate finances for teacher training, infrastructural development, and enhanced welfare programs to deliver successful university education in this digital era.

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