

INFLUENCE OF GENDER ON EDUCATORS' COMPETENCE AND USE OF DIGITAL TECHNOLOGIES IN HIGHER EDUCATION

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ABSTRACT

The study was carried out to determine the influence of gender on digital competence of educators in tertiary institutions in Imo State. The population of the study consists of 722 academic staff referred to as “educators” of Alvan Ikoku Federal College of Education Owerri, Imo State. A sample of 225 multidisciplinary educators determined using stratified random sampling was used for study. Based on the objectives of the study, 2 research questions and a hypothesis guided the study. The descriptive survey research design was adopted in conducting the study. The instrument for data collection was a researcher made likert 4-points type questionnaire titled “Educators Gender and Digital Competence (EGDC)”. It had a reliability coefficient of 0.87 determined using Cronbach alpha method. The data generated were analyzed using mean and standard deviation to answer research questions while the hypothesis was tested at 0.05 level of significance using t-test statistical tool. The result of the study revealed that educators in tertiary institutions were digitally competent; gender had no influence on the digital competence of the educators. Based on the result of the study, it was recommended that, in-service trainings, workshops, conferences should be organized to sustain and improve the competence level of educators.

Keyword's: Gender, Digital competence, Educators.

1. INTRODUCTION

The term digital technology refers to a number of 21st century Information and Communication Technology facilities used in the classroom and beyond. These include laptops, computers, tablets, personal digital assistants, interactive white boards, smart phones and applications including Word Processing, Spreadsheet, Database, SMS, Email, Webmail, Webinars, Internet, the use of e-Books, Learning Management System and mobile learning offerings. Hennessy, Ruthven and Brindley (2013) referred to digital technologies as an extension of Information and Communication Technologies (ICT) which encompass a range of hardware, software applications and information systems that generate store or process data. In the words of Odofin (2021), digital technology is the term used to cover all the computing and telecommunications whether in research, teaching, entrainment and administration. It's also a broad term which includes; communication devices or applications, radio, television, laptop, iPod, iPhone, android phones, blogs, social media, digital games, network hardware and software, satellite system etc.

The use of digital technologies is gradually becoming an enduring constituent of pedagogies all over the world. The education sector in Nigeria has in recent times witnessed an

unprecedented shift in pedagogical paradigm due to the introduction of these digital technologies. The traditional “talk and chalk” approach to teaching, which is antithetical to student-centered teaching and learning is gradually being phased out by the introduction of digital technologies in schools. The advent of these tools has also re-shaped the activities of educators in terms of research and lecture deliveries, leaving teachers with technologically revolutionized approaches and avenues of lecture presentation. Nwachukwu and Eneh (2019) stated that Information and Communication Technology has revolutionized the way we look at things, the way we act, the way we relate to people, the way we learn, relearn and unlearn. It has dramatically invaded every educational territory, including the way teachers relate with learners, thereby redefining the roles of teachers at all levels of education: early childhood, primary, secondary and tertiary.

Digital technologies have changed the way teachers teach and the way learners learn in higher education. The educators can present their lectures from a distance and the learners attend their lectures and revisit learned materials anytime anywhere with the help of digital facilities provided there is internet connectivity within the area. The application of these digital technologies in the learning process allows for collaborative learning among the learners, gives access to lecture materials and gives room for creativity and development of problem-solving skills. Learners learn at their own pace without interruptions and are actively involved in the learning process as educators become guides and not general overseers in the process. The application of digital technologies supports the constructivist mode of learning which centers on learners taking responsibility of their learning process. Zakka, Bewaran and Moris (2020) reported that the effective application of digital technologies in teaching will facilitate the realization of the stated objectives of the educational programme, by improving innovativeness, curiosity and creativity of the learners. Krull and Duart (2017) opined that the appropriate use of digital technologies and pedagogical approach in teaching could generate an improvement in the learning results of the students. In the same vein, Kennedy, Ekong, and Okorie (2022) stated that, the use of digital technologies for pedagogical purposes is a major factor for the enhancement of teaching and learning practices in the digitalized world. Odofin (2021) citing Adomi, Okiy, and Roteyan on the benefits of digital technologies noted that digital technology, when used for the purpose of learning, enhances students’ engagement in learning by searching the web for information to complete individual and group assignments, communicating via the e-mail, allowing them to connect and collaborate with their peers, as well as for entertainment. Similarly, Abid, Mohd, Mohd and Rajiv (2022) indicated that digital technologies are a powerful instrument that can help improve education in various ways, such as making it easier for instructors to generate instructional materials and providing new methods for people to learn and collaborate. The COVID-19 pandemic equally remains a clear and present indication of the crucial need to integrate technology into existing pedagogies. The negative impact of the shutdown of schools during the pandemic on educational activities especially in sub-Saharan Africa greatly underscores the need for online education as a vital part of teaching and learning, and not merely as a stop-gap crisis-management intervention. The operative use of digital technologies for teaching and learning has been identified by several researchers as a factor in increasing student engagement building essential 21st-century skills.

The success of digital technologies application in higher education system is dependent on the educators and their level of competence on handling the digital devices. Nwoke, Ikwuanusi and Onuoha (2020) citing Orji and Abolarin, referred to competence as the effectiveness or ability of anyone concerned to apply the acquired knowledge and skill to achieve desired results.

Basantes, Cabezas and Casillas (2020) see digital competence as a set of techno-pedagogical and communicative skills to function effectively in the new educational contexts generated by technology. Ferrari (2012) defined digital competence as the collection of knowledge, skills and attitudes needed to be functional in a digital environment and the appropriation of digital technology in specific environment. Napal-Fraile, Peñalva-Vélez, Mendióroz-Lacambra (2018) opined that digital competence includes issues related to technology, information, multimedia, and communication that encourage critical, responsible, and creative use of technology, which are essential to the learning process and participation in the 21st century. Similarly, Ejinwa, Ojiaku and Nnaji (2021) noted that, the concept of digital skills covers computer manipulative skills, internet navigation skills and online social media communication skills that are required for taking advantage of digital technologies, the online environment and using all forms of e-learning resources as well as engage in internet-based education activities. In the context of this study, digital competence is the ability of educators to manipulate and apply digital technologies in and outside the classroom for teaching and learning purposes. It's very necessary to possess the required digital competence in 21st century to enable educators enjoy the benefits of emerging technologies in education. Ejinwa, et al (2021) averred that it is becoming increasingly important and inexcusable not to possess digital knowledge to deliver classroom teachings. It is very vital for teachers to be equipped with digital technology skills in order to catch up with the global trends. Educators who are digitally competent tend to support and apply digital technologies in the teaching process and get committed to them. It also improves their teaching and assessment skills which reflect in their overall classroom performance. The European Commission (2018), realizing the relevance of digital competence listed five key areas regarded as competence areas: information and data literacy, communication and collaboration, digital content creation, online safety, and problem solving. The development of digital competencies is necessary both for the academics to take advantage of the opportunities offered by technological advancement and to create strategies for their professional development. It is also necessary so that academics can help the improvement of the digital competence of the students themselves (Dos Santos, Chinkes, Carvalho, Solórzano & Marroni, 2023).

One of the risk factors associated with digital competence in the Nigerian education space is gender. Gender is a social construct that differentiates between the stereotypes of masculinity (associated with the human male) and femininity (associated with the human female) in the society. This study considers gender as a very important factor that cannot be overlooked based on the assumption by some researchers that the predisposition towards and competence in the application of digital facilities in the teaching and learning process is gender-conditioned. Several researches point to the imbalances associated with gender and digital competences, which have given rise to a differentiated use of digital technologies. Some of the researchers have referred to some defined differences in the digital competences of male and female educators, while some have discovered no differences. Martínez-Cantos and Castaño (2017) noted that women have fewer digital skills than men. According to them, women use the internet less often than men, share less content online, seek less information on the web, and contribute less to collaborative platforms. In terms of online activities, men were observed to download more online content than women, engage more in online digital commercial activities, bank more, and read more news items online; while women search for health and education topics more frequently and use social networks more than men. Dar and Ponraj (2022) in their study, which was related to teachers' effectiveness and digital competence reported that male high school teachers were found to have high digital competence

as compared to their female counterparts. Hoang, Nguyen, Pham, Nguyen and Nguyen (2022) in their study reported that there are only marginal differences in digital competence between males and females. Nevertheless, the report still recorded higher male figures than females in identifying and accessing information, data and digital content related to information and data capabilities among university lecturers. Fernández, Fernández and Cebreiro (2018) confirmed through their study that male lecturers are more technically competent than their female counterparts. They noted however that females make a greater effort to integrate digital technologies into teaching. Ansari and Zuberi (2010) in their study equally reported gender differences in the use of computers between male and female students. They pointed out that male students had more computer skill knowledge than their female counterparts. The results have shown no specific direction with regard to gender and digital competence.

On the contrary, however, Sánchez, Trujillo, Gómez and Gómez (2020) reported no significant differences between the genders with respect to the application of digital skills in the classroom in professional and dual education. Goswami, Ananya and Dutta, Sraboni (2016) equally noted that researchers have come up with various models and theories to investigate factors that influence the extent to which humans use computers and their applications. They explored existing works on the Unified Theory of Adoption and Use of Technology (UTAUT) model from the gender perspective. The results concluded that gender plays a significant role in determining the intention of accepting new technology in a few contexts, while in other cases gender differences cannot be discerned. The study reviewed existing research into gender disposition to the use of digital technologies for eLearning and found that a survey by Ong and Lai (2006) in Taiwan showed that females as a result of being “more challenged by computer illiteracy” attach more importance to the ease of use of e-learning tools as compared to men, while a similar study by Liaw and Huang (2011) in Singapore concluded that male students are more positively inclined towards e-learning than female students.

Based on the inconclusive reports from reviewed studies, this present study was carried out to investigate the veracity or otherwise of the influence of gender on educator’s competence and use of digital technologies in tertiary institutions.

Purpose of the study

The main purpose of the study was to investigate the influence of gender on digital competence of educators in higher institutions. Specifically, the study will determine:

- 1) The level of digital competence of educators in higher institutions in Imo State.
- 2) The difference between male and female educators’ digital competence in higher institutions.

Research Questions

The following research questions were structured to guide the study:

- 1) What is the digital competence level of educators in higher institutions in Imo state?
- 2) What is the difference between the mean response of male and female educators on their level of digital competence?

Hypothesis

This hypothesis was formulated for the study.

H₀₁: There is no significant difference between male and female educator’s digital competence in higher institutions.

2. METHODOLOGY

The descriptive survey research design was adopted to determine the influence of gender on digital competence of educators in higher institutions in Imo State. The population of the study consists all seven hundred and twenty-two (722) academic staff in Alvan Ikoku Federal College of Education Owerri Imo State, Nigeria. A sample of two hundred and fifteen (215) academic staff comprising 90 males and 125 females was selected for the study through stratified random sampling technique. The instrument for data collection was a researcher made Likert 4-points questionnaire entitled “Educators Gender and Digital Competence (EGDC)”. It was a 23-item questionnaire organized in two sections, section A dealt with respondents’ demographic variables, while section B dealt with items related to the objectives of the study with responses ranging from, Strongly Agree (SA), Agree (A), and Disagree (D) to Strongly Disagree (SD). The instrument was validated by 2 experts in Measurement and Evaluation and one expert in Information and Communication Technology. Their expert judgment gave room to adjustment of the items where necessary. To determine the reliability of the instrument, 25 copies were administered to respondents of the same characteristics in another institution their responses were analyzed using Cronbach alpha method which gave a reliability coefficient of 0.87 which was considered appropriate for the study. The instrument was administered to the respondents on face-to-face basis and completed instruments were recovered on the spot. This led to a 100 percent recovery of the instruments. Data generated were analyzed using mean and standard deviation to answer research questions based on a criterion mean of 2.50. Any item response mean within and above the criterion mean was accepted while any below it was rejected. The hypothesis was tested at 0.05 level of significance using the T-test statistical tool.

3. RESULTS

Research Question 1: What is the digital competence level of educators in higher institutions in Imo state?

Table 1: Summary of educators’ responses on their level of competence by gender

S/No	Item	Male		Female		Remark
		X	SD	X	SD	
1	I can operate any computer system.	3.25	0.71	3.01	0.67	Accept
2	I can access my mails on internet.	3.21	0.82	3.11	0.70	“
3	I can type and send mails on internet.	3.53	0.62	3.65	0.63	“
4	I can prepare lectures on slide.	2.63	1.02	2.83	1.08	“
5	My lectures are done through projector.	2.75	1.30	2.61	1.12	“
6	I can deliver my lecture through the Google classroom.	2.51	1.20	2.60	1.15	“
7	I can use social media platforms for communication.	3.35	0.72	3.12	0.73	“

8	I can deliver lectures using computer applications.	2.54	1.21	2.50	1.13	“
9	I can type and print my documents.	3.40	0.65	3.45	0.67	“
10	I use Zoom to present my lectures.	2.51	1.11	2.57	1.6	“
11	I can send assignments to my students online.	2.85	1.00	2.92	1.02	“
12	I can create email addresses.	2.55	1.32	2.63	1.27	“
13	I can present my lectures online.	2.85	1.08	2.94	0.91	“
14	I attend and present conference papers online.	3.00	0.85	3.02	0.90	“
15	I can source and upload lecture materials online.	3.21	0.96	3.12	0.80	“
16	I can edit and print documents.	3.33	1.01	3.51	0.72	“
17	I can deliver lectures using smart boards.	2.83	0.94	2.75	1.02	“
18	I can deliver my lecture through flipped classroom approach.	2.51	1.30	2.55	0.74	“
19	I can deliver lectures through blended learning approach.	2.62	1.36	2.73	1.00	“
20	I can adopt hybrid teaching for my lecture presentation.	2.53	1.24	2.56	1.20	“
21	I can monitor my students’ academic progress online.	3.01	0.92	2.93	0.94	“
22	I can create and upload videos of my lectures online.	3.15	0.81	3.21	0.85	“
23	I can source information from e-libraries.	3.02	0.91	3.23	0.74	“
	Average Mean	2.92	1.00	2.94	0.94	

Grand Mean = 2.93

Table 1 shows that 23 items were accepted as they had response mean greater than the criterion mean. A breakdown of the response mean indicates that male educators have average response mean of 2.92 with standard deviation of 1.00 while their female counterparts have average response mean of 2.94 with standard deviation of 0.94. The grand mean of their responses stood at 2.93 which is above the criterion mean and implies moderate digital competence among the educators.

Research Question 2: What is the difference between the mean response of male and female educators on their level of digital competence?

Table 2: Summary of gender responses

Gender	X	Mean	SD	Diff in Mean	df	t-cal	t-0.05	Remark
Male	90	2.92	1.00	0.02	213	0.153	1.96	NS
Female	125	2.94	0.94					

Table 2 shows that male educators had average response mean of 2.92 with standard deviation of 1.00 while their female counterparts had average response mean of 2.94 with standard deviation of 0.94. These gave rise to a minor difference in mean of 0.02 in favour of the female educators.

H₀₁: There is no significant difference between male and female educators' digital competence in higher institutions.

Table 2 shows that the calculated t-value of 0.153 is less than the critical value of 1.96 at 0.05 level of significance and degree of freedom 213. Based on the result, the null hypothesis is upheld at 0.05 degree of freedom.

4. DISCUSSION

The result of the study revealed that all the 23-items which are indices of digital competence enlisted on the questionnaire were accepted as they had response mean greater than the criterion mean. Also, the grand mean of the responses is moderately above the criterion mean which indicates that, the educators have moderate competence in various aspects of digital technologies. This is suspected to emanate from the consistent clamor by school authorities mandating educators to present their lectures through digital avenues. The result is in line with Nwoke, et al (2020) which revealed that educators are moderately competent with the use of social media platforms for personal purposes such as communications, information, sourcing of academic materials, and other social factors.

Finally, the study revealed that a minor mean difference exists between the digital competence level of male and female educators in the use of the facilities. However, further statistical analysis revealed no significant difference between male and female digital competence and their usage. The awareness of digital competence and use in education has cut across all educators in higher institutions and gender has no influence on it. This result aligns with the findings of Sánchez, Trujillo, Gómez and Gómez (2020) as earlier reviewed.

5. CONCLUSION

This study investigated the influence of gender on digital competence of educators in the multidisciplinary areas of science/technology, language/humanities and pedagogy in higher institutions for a balanced perspective. The result of the study revealed that both male and female educators in all combined areas are digitally competent in higher institutions in Imo state. The study concludes that gender has no influence on the digital competence of educators in higher institutions in Imo State.

6. RECOMMENDATIONS

Based on the results of the study, the following recommendations were made:

- 1). In-service Trainings, workshops, conferences should be organized to sustain and improve the competence level of educators.

2). Government, school authorities, private organization and Non-Governmental Organizations should provide digital facilities to institutions of higher education to enable educators apply them in the classrooms.

3). Electricity should be made available through alternative energy sources be made available in higher institutions to enable educators use digital technologies.

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