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Perception of Universities staff on Digital Citizenship Awareness, Literacy and Harmonization of National Databases in Nigeria

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Digital citizenship refers to the ability, confident and positive espousal with available digital technologies. It include such aspects like awareness, literacy, skills and is to achieve and understand digital literacy as well as to ensure online safety, cyber security, digital responsibility, digital health and well-being. This research study was quantitatively undertaken to explore the level of awareness and literacy on digital citizenship and harmonization of national database among university staffs in Nigeria. A scale was designed and adopted for this study. A set of 385 staffs were involved in the investigation. A Principal Component Analysis was affected upon the questionnaire items for validity with significance at 0.47, and also a reliability test was done where a significant Chronbach alpha value of 0.90 was established. The anticipated result from the analysis on the constructs indicated the followings: a moderate level of awareness and literacy on digital citizenship. It also indicated some significant level of perception on harmonization of relevant national databases. The result as well showed no statistical differences among the staff on level of awareness and literacy on digital citizenship between gender and between staff category; but there might be a statistical difference among them in terms of university.

Keywords **—'Digital Citizenship''Awareness''Literacy''Data Harmonization''University StaffNigeria'**

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I. INTRODUCTION

Digital citizenship refers to the ability, confident and positive espousal with available digital technologies. Digital citizenship education (DCE) which involves aspects such as awareness, literacy and skills is essential to help staff/student's to achieve and understand digital literacy, as well as to ensure online safety, cyber security, digital responsibility, digital health and well-being (The Scientific World-March 09, 2020; Logan, 2016). We live today in a rapidly changing world with expanding horizons in technology that has brought not only new experiences, but a whole new dimension to daily life via an ethereal online world. Many were not born "digital natives" as the youngsters of today and thus; do not have the same automatic acceptance of the digital environment as a natural and fundamental dimension of present requirements (Logan, 2016).

The Council of Europe (2022) as cited in Snežana, (2022) averts that presence online matters a lot. The e-Presence is when one maintains the presence

online and extends to one's wholistic social qualities for a digital reputation and digital identity. The e-Presence involves both direct and indirect situations. It's crucial for individuals to navigate both direct and indirect e-presence responsibly, as highlighted by Jones & Mitchell (2016) and Heath (2018). Digital citizenship education becomes paramount in addressing those challenges arising from the borderless nature of the online world, emphasizing the need to protect online identities and personal data for a culturally diverse and technologically evolving society (Snežana, 2022).

A. Problem statement

It's true that the implementation of digital citizenship education has faced challenges, particularly in developing countries (Ribble, 2015). The focus on adult citizens' data by governments may have overshadowed the need for comprehensive programs for teachers and students. Bridging this gap is crucial for fostering responsible and informed online interactions.

It has been practically observed that currently, do exist a gap of minimal researches and investigations that focused on achieving and actualizing digital citizenship and its practices especially in relation to harmonization of data of citizens in tertiary schools. The lack of research on harmonizing national databases with education levels, coupled with limited focus on digital citizenship in educational settings, poses a potential risk. Insufficient attention to these issues may contribute to the development of poor technology habits among students, as highlighted by previous studies (Dunaway & Macharia, 2021; Al-Zahrani, 2015; Kim & Choi, 2018; Pedersen et al., 2018). Addressing these gaps is crucial for fostering responsible technology use and ensuring alignment with educational initiatives.

B. Significance of the study

The research results emphasized the crucial role of data harmonization in educational institutions, providing leaders with vital information. This data can be instrumental in developing programs focused on digital citizenship, aiding educators in addressing related issues across all levels of education. The findings offer a foundation for designing curriculum development models and implementation mechanisms to cultivate a robust digital citizenship in Nigeria and other developing nations, fostering awareness and enhancing citizenship literacy among staff and students.

C. Research objectives

The study opted to formulate the following objectives:

1. To examine level of awareness on digital citizenship among staff of Federal University in North Western Nigeria.
2. To examine the literacy level on digital citizenship among staff of Federal University in North Western Nigeria.
3. To assess the perception on harmonization of relevant national databases among staff of Federal University in North Western Nigeria.
4. To assess the statistical difference on the level of digital citizenship literacy and awareness among staff of Federal University in North Western Nigeria in terms of gender.
5. To assess the statistical difference on the level of digital citizenship literacy and awareness among staff of Federal University in North Western Nigeria in terms of staff category.
6. To assess the statistical difference on the level of digital citizenship literacy and awareness among staff of Federal University in North Western Nigeria in terms of university.

D. Research questions

1. To what level is awareness on digital citizenship among Federal University staff in North Western?
2. To what level is literacy level on digital citizenship among Federal University staff in North Western Nigeria?
3. To what level is the perception on harmonization of relevant national databases

among staff of Federal University in North Western Nigeria?

4. What is the statistical difference on level of digital citizenship literacy and awareness among Federal University staff in North Western in terms of gender?
5. What is the statistical difference on level of digital citizenship literacy and awareness among Federal University staff in North Western in terms of staff category?
6. What is the statistical difference on level of digital citizenship literacy and awareness among Federal University staff in North Western in terms of university?

II. LITERATURE

A. Definition of Digital Citizenship

Digital citizenship, as defined by Atif & Chou (2018) and Choi (2016), encompasses the norms of appropriate and responsible behavior, involving critical thinking and ethical decision-making while using the Internet. This ethical and competent engagement should ideally commence in early childhood, extending across various educational settings, as highlighted by Atif & Chou (2018). According to Choi (2016), a digital citizen possesses the skills to actively and responsibly participate in both online and offline communities, emphasizing that competence building are a lifelong process due to the ever-evolving nature of digital technologies.

Mossberger, Tolbert, & McNeal, (2007) emphasizeded that digital citizenship and engagement involves a wide range of activities, such as creating, consuming, sharing, playing and socialising, to investigating, communicating, learning and working. They further stated that the competent digital citizens should accept and deal with challenges related to everyday learning, work, and leisure with utmost participation in society by respecting human rights and intercultural differences.

According to the Council of Europe (2022) in Snežana, (2022), digital citizenship can be defined as:

"The competent and positive engagement with digital technologies (creating, working, sharing, socializing, investigating, playing, communicating and learning); participating actively and responsibly (values, skills, attitudes, knowledge) in communities (local, national, global) at all levels (political, economic, social, cultural and intercultural); being involved in a double process of lifelong learning (in formal, informal and non-formal settings) and continuously defending human dignity." (Council of Europe, 2022) in Snežana, (2022)

According to Çubukçu & Çubukçu (2017), a digital citizen is one who embraces online opportunities, adheres to ethical values, and exhibits responsible behavior. Choi (2016) expands this to include the extension of traditional citizenship principles to the online realm. Choi, Glassman, and Cristol (2017) as well as Choi, Cristol, and Gimbert (2018) propose three schemas for understanding how digital citizenship behaviors function.

(1) critical approach: the idea that individuals control behavioral trajectories offered by new technologies, such as the Internet;
(2) civic citizenship in the space of flows: the understanding that the Internet has provided increased abilities to network within new contexts and more ways in which information flows within these spaces; and
(3) the choice availability approach: the focus on the possibility of users to move easily within online spaces and the abilities which allow them to do so.

B. Theories on digital citizenship

Ribble's (2011) exploration of digital citizenship focused on understanding its actualization through elements such as knowledge, beliefs, and instructional practices. Emphasizing the importance of awareness, he highlighted the need to teach individuals, including children, about effective and appropriate use of digital technologies. The complexity of digital citizenship, according to Ribble, involves issues of technology use, abuse,

and misuse, guiding users to make informed decisions. Additionally, Siemens' connectivism theory (2004) aligns with digital citizenship by recognizing learning as a social behavior, asserting that knowledge is gained through connections within learning communities and networks. Siemens' connectivism theory integrates behaviorism, cognitivism, and constructivism, viewing learning as actionable knowledge. This involves learners connecting to and contributing information to a learning community. In a connectivist approach, educators shape environments to effectively share their knowledge. Additionally, teachers guide students in responsibly using technology, addressing ethical considerations. This perspective offers a framework for aligning digital citizenship plans and implementing them within classrooms and workplaces (Kim & Choi, 2018; Pedersen et al., 2018).

C. Model for digital citizenship

There are some dimensions of competences for democratic culture model (Yves & Barbara, 2013); Snežana, 2022) which reflected four (4) key areas: values, attitudes, skills and knowledge.
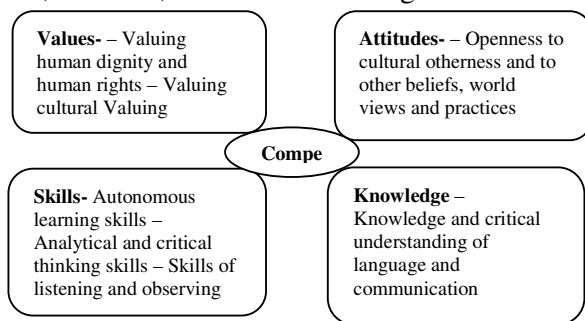

Values- – Valuing human dignity and human rights – Valuing cultural Valuing	Attitudes- – Openness to cultural otherness and to other beliefs, world views and practices
	Compe
Skills- Autonomous learning skills – Analytical and critical thinking skills – Skills of listening and observing	Knowledge – Knowledge and critical understanding of language and communication

Figure 1: Framework Model on Digital citizenship competences:
Source: (Yves & Barbara, 2013; Snežana, 2022)

Reflecting this framework of competences of the digital environment where young people grow up today, are divided into three areas viz: i. being online (e-presence) ii. well-being online (empathy) and iii. having rights online (ethically active). It's evident that being a responsible digital citizen involves critical thinking, positive online interactions, empathy, and maintaining health and well-being in virtual and real spaces. Additionally,

understanding rights and responsibilities, such as privacy, security, and freedom of expression, is crucial for meaningful and ethical participation in the digital world (Hilbert & López, 2011; Dunaway & Macharia, 2021; Snežana, 2022).

D. A digital citizen

According to David (2022) a digital citizen is anyone who advocates and adheres to the responsible use of the technology like: the Internet, computers, smartphones and any other digital devices. Riccio (2022) highlights the importance of being a responsible digital citizen by promoting positive online interactions and staying vigilant against scams or toxic behavior. Cyberbullying avoidance and empathy are key components, contributing to a safer online environment. Razzaq (2021) underscores the significance of digital citizenship in safeguarding human rights online, including freedom, privacy, and security. Education and awareness play crucial roles in empowering individuals to use their knowledge for protection and promotion of these rights.

E. Awareness on digital citizenship

Ribble, Bailey, and Ross, (2004); Ribble, (2011); Ohler, (2011); Snelling, (2016) popularized the term digital citizenship, which is the societal view of the appropriate and responsible use of technology. Ribble (2011) identified some nine (9) elements of standard digital citizenship which included:

  i. Digital access: advocating for equal digital rights and access.
  ii. Digital etiquette: rules and policies an appropriate conducts online.
 iii. Digital law: users to understand it's a crime to steal or damage another's digital rights.
 iv. Digital communication: users need to make appropriate decisions and communication.
  v. Digital literacy: teach students how to learn about a digital society and learn in it.
 vi. Digital commerce: purchases online must be effective in a digital economy.

vii. Digital rights and responsibilities: people get inform of their basic digital rights and freedom.

viii. Digital safety and security: digital citizens need to protect their information from outside harm.

ix. Digital health and wellness: psychological issues, such as internet addiction, users avoid risks.

Xu, Yang, and Zhu, (2019) added that the redeveloping curriculum standards was to create awareness for standards of citizenship that better aligned with the changing world of inter-connectedness. The act of being a standard digital citizen requires certain mutually agreed behaviors that benefit the community and society as a whole. Having those behaviors would propelled positive, safe, responsible online engagement and away from negative, harmful interactions. Atif & Chou, (2018); Choi, (2016) further recognized the important dimensions of ethics in online spaces; whereby people interact online in a safe, responsible and ethical manner. It is therefore important to note that digital citizenship allows citizens to use technology and humanity in a thoughtful and empathetic manner (Hilbert, & López, 2011). Thus, teachers and students should be guided in developing safety awareness and be prepared for the digital world (Jordan, 2018). Youngsters are mostly vulnerable online because they ignorantly exposed much of their private information on social media. This is very serious because hacker may use such by snowball to attack other adults and even the entire societal network system.

F. Literacy on digital citizenship

Razzaq, Sheikh & Tariq, (2021) stated that digital literacy refers to having knowledge by understanding the usage and maintaining security in applying digital tools, resources and some other network deployments. Digital literacy comprises of such capabilities in utilizing the accessible digital tools with care and in an efficient way in order to further understand, learn, generate, and manipulate information and to share or collaborate with others.

According to report of the Pew Research Center study done in 2018; Razzaq, Sheikh & Tariq, (2021) said that "95% of adolescents are reported to having or accessing a smartphone. It further showed that 45% are being constantly online. There has also been a significant increase in teenage use of social media and lots of online resources.

G. Benefits of digital citizenship

It's evident that fostering digital citizenship is crucial in promoting positive online behavior and safeguarding individuals from potential risks. Education on digital citizenship equips both students and teachers with the skills to navigate the digital landscape responsibly, ensuring a safer and more respectful online community (David, 2022; Çubukçu & Çubukçu, 2017; Jordan, 2018; Alqahtani, 2017).Therefore in Nigerian universities there is need to promote and advocate for the inclusion of ICT literacy and skills into the curriculum so as to have adequate ICT literacy and use of e-Resource (Suleiman & Ena, 2022).

H. Principles of digital citizenship

There are a number of ways to maintain responsible digital citizenship, with most centering on awareness, productive interaction, safe usage, and building a good base of online knowledge. Here are some principles as suggested by David (2022).

1. Understand online world:by not access the internet always without having knowledge how it works. It good to take some time to find out and on research how the internet works in order to appropriately conduct oneself while online.

2. Respectful to other digital citizens: as like in the real world, one should always practice empathy with anyone met online. It not always a real person, it might be an avatar or just a merely screen name which one interact with.

3. Careful on what to Share: being empathic is essential, but that doesn't mean one should blindly trust anyone met online. Skepticism is especially important for students and other vulnerable members of society like the elderly. Avoidance to share address, photos, or any personal information anyone online it's quite important so as not to fall prey to scammers around the digital world.

4. Vigilant on scams: there are numerous ways cybercriminals can scam someone online; however, it can only be avoided with the right knowledge and tools.

5. Data and identity protection: by accidental sharing of personal information or revealing about oneself identity, should not panic; but rather can use identity threat scan, to see if it has been compromised, then quick and appropriate action steps should immediately be taken to stop it.

I. Harmonization of data in Nigeria

The National Identity Management Commission (NIMC) plays a crucial role in Nigeria's identity management system, established through the NIMC Act of 2007(Musa, 2000). Over four decades, the government has prioritized the development of a framework for national identity management for socioeconomic and political progress. The NIMC Act covers the establishment of NIMC, functions, National Identity Database, General Multi-purpose cards, and National Identification Number (NIN). The repeal of the Department of National Civic Registration (DNCR) and asset transfer to NIMC are also addressed. According to NIMC (June 28, 2021), 57.3 million Nigerians have completed NIN registration. Data harmonization and standardization, as defined by Ayamba and Ekanem (2016) and NIMC (2020), are essential for capturing, defining, and reconciling government information. The goal is to create a comprehensive national database, providing accurate digital identification for citizens and legal residents, as highlighted by Prince Osuagwu's report in 2015.

All children will be assigned a NIN, when possible, especially at the time of birth. It is very important for several service organizations such as education and health to be able to identify children uniquely in order to deliver services effectively. However, children's fingerprints are not fully formed and hence cannot be used for de-duplication given current state of technology. Hence during enrolment, details of the parents are captured in order to link the child to established NINs so that either of the parents can be used to authenticate the child pending when he grew up and got updated on the database. The national policy aims to establish a National Identity Management System (NIMS) in Nigeria, centered around the unique National Identification Number (NIN). This system integrates various institutional databases, ensuring seamless authentication and verification of individuals across government and private sectors, including the issuance of Smart Cards for citizens (Fidelia, 2021).

J. Benefits of data harmonization in Nigeria

According to National Identity Management Commission (NIMC) (2020) data harmonization and standardization facilitates the submission and processing of trade information (documents and data). It can thus, help to:

1. reduce information requirements by eliminating redundancies and duplications, thus making the submission easier,
2. improve the quality of the data and therefore reduce errors,
3. facilitate receiving, processing and checking of information, and
4. facilitate exchange of data and improve automation as this ensures inter-operability.

Data harmonization is an important aspect of any automation project, in particular for a Single Window for Trade, for the migration to paperless trade, and for document alignment. It is on these notes Oghenevwede (2022) reported that the President Muhammadu Buhari has directed all government data and biometrics collating agencies to harmonise their data collation before the end of his second term in 2023. The government agencies

identified for harmonization by (NIMC, 2020) are as follows:

i. Independent national electoral commission (INEC) which regulates voters register ii. National health insurance scheme that regulates health records iii. National population commission (NPC) that coordinates census, birth/death registry iv. National pension commission (NPENCO) this controls pensioners' databank v. Nigeria immigration service (NIS) for issuance international passports vi. Federal road safety commission (FRSC) it issues driver's licenses vii. Federal Inland Revenue service (FIRS) which controls tax payers' database viii. National civic registration (NCR) which manages national identity cards ix. Nigeria communication commission (NCC) this is the body that regulates mobile phone services x. The Nigerian police force (NPF) it is in charge of policing xi. Nigerian prison services (NPS) they keep inmates xii. Joint tax board (JTB) this harmonizes tax payers' database xiii. Corporate affairs commission (CAC) registers and regulate companies' database xiv. Economic and financial crimes commission (EFCC) that deals with financial crime database xv. Central bank of Nigeria (CBN) this houses and controls all banks' database xvi. State security services (SSS) which is in charge all security affairs and records xvii. National security adviser (NSA) office, it manages the security policies in the country xviii. Integrated payroll and personnel information service (IPPIS), xix. National health insurance scheme this is in charge of health revolving fund (NHIS) xx. National housing fund (NHF) this deals with the provision of shelter for the citizens.

Oghenevwede, (2022) also wrote, the directive further states "I have instructed the Ministry of Communications and Digital Economy and all other government agencies that collate data and biometrics to harmonise all the data they have collected, so that Nigeria can have a central data base before the end of my tenure. Stressing on the importance and benefits of data harmonization for achieving digital citizenship, the president Muhammadu Buhari also stated that "with the right database in place, it will guide government to plan and take critical decisions on education, health agriculture; thus, data harmony will guide government to come up with effective national policies."

III. METHODOLOGY

A. Design

The design of this research is longitudinally empirical in nature. The subjects of the analysis are limited to tertiary staff of all the seven (7) Federal Universities in North Western Nigeria which included: ABU Zaria, FUDMA Dutsin-Ma, BUK Kano, FUD Dutse, UDUS Sokoto, FUGUS Gusau, and FUBK Kebbi. To make it feasible and to avoid bias the total number of three hundred and eighty five (385) academic and non-academic staff participants were purposely selected at random from a clustered category of staff in those seven (7) universities, across the faculties / directorates, departments / units both teaching and non-teaching staff, different programs, levels, ranks and gender.

The research was carried out using a quantitative survey research method. The survey instrument was developed using scales that have previously been developed and validated by expert in the field of test and measurement. It was used to determine the level of awareness, literacy on digital citizenship and perception on harmonization of national databases for the actualization of a viable digital citizenship in Nigeria.

B. Population

The population for the study were all the staff both teaching and non-teaching of the federal universities in the north western Nigeria. On this note, based on Nigerian University Commission (NUC) report there are a total of two hundred and seventy (270,000) staff in the over 200 Nigerian universities. This composed of one hundred thousand (100,000) lecturers and one hundred and seventy (170,000) non-teaching staff (Deborah, 2022). The targeted sample group consisted of a total number of (385) staff of the universities both academic and non-teaching in north western in

Nigeria. According to Kreijcie and Morgan, Cresswell, (2007); Buyukozturk, (2018) and an online calculator.net a population that reached up to 10 million a total of three hundred and eighty five (385) sample is enough.

C. **Sample and Sampling Technique**

Sampling method used was purposive random sampling because it allows for deep research through selecting information depending on the purpose of the study (Buyukozturk, 2018). On this note all the participants were staff of federal in the North western geopolitical zone of Nigeria. That was done through the help of engaged research assistant at each designated point in selected universities; having positive anticipation that these set of staff have adequate knowledge, ethics and academic awareness to respond as appropriate to the issues in questions. They were purposely and randomly selected considering these clusters: the university, category of staff, gender, faculties, discipline, designation and educational qualification. But only three dimensions (university, category of staff, gender) were considered for the analysis.

D. **Data Collection**

The data collection tool was through a re-modified and adopted questionnaire developed by Kus, Gunes, Basarmak and Yakar (2017) modified by Yıldız, Metin Ç. and Ayşe A. (2020). The questionnaire scale have 31 items to measure literacy, 19 items to measure awareness and 9 items to measure data harmony all the (59) item cases were on a five point Likert scale options. These options were rated as "(5) strongly agree", "(4) agree", "(3) undecided", "(2) disagree", "(1) strongly disagree" scores. For ascertaining the validity and the reliability of the questionnaire scale items, the principal component analysis (PCA) of kaiser-mayer- olkin (kmo) value of (0.47) (0.000) as well as the chronbach alpha value of (0.901) were respectively determined.

E. **Data Analysis**

For the analysis of data the SPSS (Statistical Package for Social Sciences) version 23 was used to screen, validate and evaluate the data obtained from the survey research and which was used to create tables. On the tabular form a frequency (f), percentage (%), average mean ($\bar{x}$), and standard deviation (SD) values used in the presentation of descriptive result obtained from the analyzed data collected in order to answer the research questions 1, 2 and 3 on the level of digital citizenship literacy, awareness, and harmonization of databases; while questions 4, 5 & 6 were presented as was used to assess the variation on digital citizenship literacy, awareness, and harmonization of databases in terms of gender, staff category and university. Participation in the data collection survey was voluntary.

IV. RESULTS AND DISCUSSIONS

TABLE 1:
DEMOGRAPHY DISTRIBUTION ON GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	M	301	78.2	78.2	78.2
	F	84	21.8	21.8	100.0
	Total	**385**	**100.0**	**100.0**	

Table 1 depicts the demography of the participants for the study which indicated males as the majority with a total frequency of (301) representing (78.2%) while the females have a frequency of (84) representing (21.8%). This indicated that male staffs are more than the female in the federal universities in north western region of Nigeria.

TABLE 2:
DEMOGRAPHY DISTRIBUTION ON UNIVERSITY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ABU	62	16.1	16.1	16.1
	BUK	56	14.5	14.5	30.6
	FUD	34	8.8	8.8	39.5
	UDUS	63	16.4	16.4	55.8
	FUGUS	63	16.4	16.4	72.2
	FUB	51	13.2	13.2	85.5
	FUDMA	56	14.5	14.5	100.0
	Total	**385**	**100.0**	**100.0**	

The results on table 2 shows the level of demography distribution in terms of the university where UDUS, FUGUS and ABU has the highest Numbers of staff (63) that participated in the research- ranking almost (16.4%) each; while BUK, FUDMA and FUBK followed with (14.5%) each and FUD indicated the lowest score of (34) which represent merely (8.8%).

TABLE 3:
DEMOGRAPHY DISTRIBUTION ON STAFF CATEGORY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**TEACHING STAFF**	277	71.9	71.9	71.9
	NON-TEACHING	108	28.1	28.1	100.0
	Total	**385**	**100.0**	**100.0**	

On the staff category it is shown on table 3 that teaching staff are more having the frequency score of (277) representing (71.9%) while non-teaching staff are (108) which represented (28.1%).

TABLE 4
KAISER-MEYER-OLKIN (KMO) AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.427**
Bartlett's Test of Sphericity	Approx. Chi-Square	41466.570
	Df	1711
	Sig.	**0.000**

TABLE 5:
RELIABILITY TEST SHOWING CHRONBACH ALPHA VALUE

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.901	0.899	59

To ensure the reliability and the validity of the questionnaire items, reliability and validity tests were conducted. The principal component analysis (PCA) test with the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (0.427); the Chi-square on the Bartlett's test of Sphericity showing (41466.570) and the Chronbach Alpha test showing (0.901) indicating that all were significant at (0.000) as shown in table 4 and table 5. However the Alpha value can change to (0.89) if some items deleted.

Research Question One: To what level is awareness on digital citizenship among Federal Universities staff in North Western Nigeria?

TABLE 6:
DESCRIPTIVE RESULTS ON LEVEL OF AWARENESS ON DIGITAL CITIZENSHIP AMONG FEDERAL UNIVERSITY STAFF IN NORTH-WESTERN NIGERIA

Digital Ettiques	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	M	SD
I can collaborate online and share an opinion without harassing others	242 (53.0%)	162 (42.1%)	18 (4.7%)	1 (.3%)	0	1.5221	.59961
I can read others opinions and engage with them in an ethical way	191 (49.6%)	161 (41.8%)	22 (5.7%)	1 (.3%)	10 (2.6%)	1.6442	.82008
I can recognize acceptable and unacceptable mode of things online	176 (45.7%)	159 (41.3%)	48 (12.5%)	2 (.5%)	0	1.6779	.70722
I can recognize situations online when individuals are harassed, bullied or badly treated	140 (36.4%)	208 (54.0%)	28 (7.3%)	9 (2.3%)	0	1.7558	.68665
I use appropriate or constructive language in online discourse	98 (25.5%)	204 (53.0%)	62 (16.1%)	21 (5.5%)	0	2.0156	.79698
Valid N (listwise)	**385**						

Digital Law	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	M	SD
I use the Internet as a source to read news	142 (36.9%)	197 (51.2%)	44 (11.4%)	2 (.5%)	0	1.4909	.53087
I know the difference between free and non-free online resources	200 (51.9%)	183 (47.5%)	2 (.5%)	0	0	1.6701	.75537
I am aware of what plagiarism is	193 (50.1%)	127 (33.0%)	64 (16.6%)	1 (.3%)	0	1.7662	1.38346
I was taught on the policies and regulations for online usage	179 (46.5%)	181 (47.0%)	1 (.3%)	19 (4.9%)	5 (1.3%)	1.7558	.73783
Valid N (listwise)	**385**						

Digital Right and Responsibilities	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	M	SD
I believe I have a right to express my opinion in online environments	132 (34.3%)	194 (50.4%)	0	58 (15.1%)	1 (.3%)	1.9 662	.98 499
I believe I should be given opportunities to work in collaborative online environments	214 (55.6%)	155 (40.3%)	3 (.8%)	13 (3.4%)	0	1.5 195	.68 485
I believe I have a responsibility to use technology to promote the online world in globally	157 (40.8%)	188 (48.8%)	40 (10.4%)	0	0	1.6 961	.64 840
I am aware of global social issues regarding the Internet	115 (29.9%)	0	0	270 (70.1%)	0	1.7 013	.45 828
Valid N (listwise)	**385**						

Digital Safety and Security	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	M	SD
I use different passwords for my online accounts	169 (43.9%)	134 (34.8%)	21 (5.5%)	58 (15.1%)	3 (.8%)	1.9 403	1.0 7967
I know how to create secure passwords	133 (34.5%)	243 (63.1%)	1 (.3%)	8 (2.1%)	0	1.6 987	.58 419
I was taught on the importance of keeping passwords a secret	135 (35.1%)	249 (64.7%)	0	1 (.3%)	0	1.6 545	.49 227
I keep my account passwords in any place where anyone could access it	93 (24.2%)	147 (38.2%)	40 (10.4%)	40 (10.4%)	65 (16.9%)	2.5 766	1.3 9753
I carelessly share my pictures online	93 (24.2%)	139 (36.1%)	33 (8.6%)	59 (15.3%)	61 (15.8%)	2.6 260	1.4 0696
Valid N (listwise)	**385**						

The results in Table 6 indicate a positive trend in digital citizenship awareness among university staff in Nigeria. The majority of respondents show strong agreement (95.1%) with the ability to collaborate online without harassment. Similarly, there's high acceptance (91.4%) of engaging with others' opinions ethically. The awareness of acceptable and unacceptable online behavior is prevalent (87%), along with a positive perception of recognizing online harassment situations (90.4%). In terms of digital law awareness, the majority (86.8%) acknowledges being taught online usage policies, and a high awareness of plagiarism (93.5%) is observed. Respondents also demonstrate understanding of the difference between free and non-free online resources (83.1%). The use of the internet for news is widespread (99.5%). Concerning digital rights and responsibilities, the majority strongly agrees (84.7%) with the right to express opinions online, emphasizing a favorable attitude toward freedom of expression. There's also a positive inclination (96.5%) towards collaborative online work and a responsibility (89.6%) to use technology for global online promotion. However, a significant portion (70.1%) disagrees with statements related to global social issues concerning the Internet. Regarding safety and security awareness, respondents generally adhere to password best practices. While there's confidence in creating secure passwords (97.6%), a notable proportion (35.1%) acknowledges keeping passwords in accessible places. Concerns arise about picture-sharing habits, with a sizable portion (31.7%) disagreeing with the statement that they carelessly share pictures online.

Overall, the findings suggest a positive perception of digital citizenship awareness, literacy, and online culture among the university staff. However, there are areas, such as cybersecurity practices and global social issues, where further education and awareness might be beneficial.

Research Question Two: To what level is literacy on digital citizenship among Federal University staff in North Western Nigeria?

TABLE 7:
DESCRIPTIVE RESULTS ON CITIZENSHIP LITERACY AMONG FEDERAL UNIVERSITIES STAFF IN NORTH WESTERN NIGERIA

Digital Literacy	SA F (%)	A F (%)	UF (%)	D F (%)	SD F (%)	M	SD
I know the Internet can be used to find information	301 (78.2%)	84 (21.8%)	0	0	0	1.21 82	.41 355
I can use the Internet to find information	264 (68.6%)	121 (31.4%)	0	0	0	1.31 43	.46 483
I can share information using the Internet	279 (72.5%)	96 (24.9%)	10 (2.6%)	0	0	1.30 13	.51 298
I can identify quality of material located on the Internet	208 (54.0%)	153 (39.7%)	23 (6.0%)	1 (.3%)	0	1.52 47	.62 085
I can use the Internet to locate different media sources	302 (78.4%)	83 (21.6%)	0	0	0	1.21 56	.41 176
I can share reputable information using web based tools	238 (61.8%)	145 (37.7%)	2 (.5%)	0	0	1.38 70	.49 827
I can research and evaluate sources found on the Internet	234 (60.8%)	149 (38.7%)	1 (.3%)	1 (.3%)	0	1.40 52	.53 714
I can use the Internet to search for answers to questions	256 (66.5%)	108 (28.1%)	16 (4.2%)	3 (.8%)	2 (.5%)	1.40 78	.65 942
I can collect, organize, and generate information digitally	285 (74.0%)	80 (20.8%)	16 (4.2%)	3 (.8%)	1 (.3%)	1.32 47	.61 749
Valid N (listwise)	385						

Digital Access	SA F (%)	A F (%)	UF (%)	D F (%)	SD F (%)	M	SD
I know about different types of technologies or software for different learning needs	151 (39.2%)	190 (49.4%)	43 (11.2%)	1 (.3%)	0	1.72 47	.66 304
I use different types of technologies or software to support varied instruction needs	106 (27.5%)	238 (61.8%)	38 (9.9%)	3 (.8%)	0	1.83 90	.61 664
I believe I have opportunities to learn with technology	186 (48.3%)	196 (50.9%)	1 (.3%)	2 (.5%)	0	1.52 99	.53 499
I can use technology outside of my classroom/office to access library and other websites	161 (41.8%)	188 (48.8%)	0	18 (4.7%)	18 (4.7%)	1.81 56	.99 727
I can share information with other at any time I feel like	156 (40.5%)	188 (48.8%)	23 (6.0%)	0	18 (4.7%)	1.79 48	.91 968
I believe that technology can be used to support staff with disabilities	213 (55.3%)	140 (36.4%)	32 (8.3%)	0	0	1.52 99	.64 531
I believe most staffs have access to Internet and mobile devices at home.	219 (56.9%)	106 (27.5%)	27 (7.0%)	15 (3.9%)	18 (4.7%)	1.71 95	1.0 676 4
Valid N (listwise)	385						

Digital Communication	SA F (%)	A F (%)	UF (%)	D F (%)	SD F (%)	M	SD
I use the Internet to communicate with other staff / students and my families online	206 (53.5%)	144 (37.4%)	0	17 (4.4%)	18 (4.7%)	1.69 35	1.0 204 1
I know how to use the technology devices in my office and outside classroom	170 (44.2%)	196 (50.9%)	0	19 (4.9%)	0	1.65 71	.72 303
I use digital tools to assist myself with support from home or school	142 (36.9%)	205 (53.2%)	1 (.3%)	19 (4.9%)	18 (4.7%)	1.87 27	.98 790

	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	M	SD
I have a working knowledge of email, text, messaging, and social media	240 (62.3%)	124 (32.2%)	3 (.8%)	18 (4.7%)	0	1.47 79	.73 962
I use online collaborative tools with other students and teachers	153 (39.7%)	157 (40.8%)	41 (10.6%)	34 (8.8%)	0	1.88 57	.91 993
I can use digital media tools to communicate efficiently and effectively	163 (42.3%)	180 (46.8%)	20 (5.2%)	4 (1.0%)	18 (4.7%)	1.78 96	.94 643
I can efficiently use network and be able to do CBT and online exam	187 (48.6%)	153 (39.7%)	23 (6.0%)	22 (5.7%)	0	1.68 83	.82 380
Valid N (listwise)	**385**						

Digital Commerce	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	M	SD
I know how to use web technologies to purchase goods.	228 (59.2%)	101 (26.2%)	56 (14.5%)	0	0	1.55 32	.73 449
I am using electronic transactions.	233 (60.5%)	136 (35.3%)	16 (4.2%)	0	0	1.43 64	.57 439
I can recognize legitimate websites for online purchases	192 (49.95%)	149 (38.7%)	44 (11.4%)	0	0	1.61 56	.68 295
I can advertise, propagate and sell items online	206 (53.5%)	138 (35.8%)	40 (10.4%)	1 (.35%)	0	1.57 40	.68 492
I can use online banking transaction anywhere	221 (57.4%)	55 (14.3%)	45 (11.7%)	46 (11.9%)	18 (4.7%)	1.92 21	1.2 600 2
I can make payment online, on Remita, POS and ATM	254 (66.0%)	107 (27.8%)	0	10 (2.6%)	14 (3.6%)	1.50 13	.91 891
I can secure my financial login details and password	167 (43.4%)	196 (50.9%)	2 (.5%)	20 (5.2%)	0	1.67 53	.73 671
I understood the meaning of cashless society	153 (39.7%)	206 (53.5%)	4 (1.0%)	20 (5.2%)	2 (.5%)	1.73 25	.76 961

Valid N (listwise)	**385**

The literacy level dimension indicates a high belief (78.2%) in the value of the internet for obtaining information. Respondents express confidence in their ability to use (68.6%) and share information (72.5%) online. A significant portion (54.0%) feels confident in identifying the quality of material on the internet. The majority (78.4%) can use the internet to locate different media sources, showcasing a high level of digital literacy. Respondents are confident in their ability to search for answers (66.5%) and collect, organize, and generate information digitally (94.8%). This suggests proficiency in utilizing the internet for information retrieval and management.There's a positive attitude towards using technology for instructional needs (89.4%) and opportunities to learn with technology (99.2%). However, some respondents (9.9%) remain undecided on using technology for instructional needs. A majority (90.6%) express a positive attitude towards using technology outside their designated spaces. Confidence in sharing information anytime is high (89.4%), but a small proportion (4.7%) disagrees with this statement. Respondents agree that technology can support staff with disabilities (91.7%) and believe staff has access to the internet and mobile devices at home (84.4%). Communication through the internet is widely accepted (53.5% strongly agree, 37.4% agree), and respondents know how to use technology devices both in and outside the classroom (95.1%). Digital tools for support at home or school are commonly used (90.1%), and there's confidence in knowledge of communication tools (94.5%). Online collaborative tools are accepted by the majority (80.5%), but some (10.6%) remain undecided, suggesting a need for clarification. Positive sentiment towards digital media tools for communication (89.1%) is noted, with a minority (5.7%) disagreeing. Proficiency in using networks for Computer-Based Training (CBT) and online exams is expressed by a majority (88.3%). In digital commercial activities, respondents are confident in using web technologies for purchases (85.4%) and online banking transactions (71.7%). Confidence in

recognizing legitimate websites for online purchases is high (88.6%), but a small proportion (10.4%) remains undecided. A majority understand the concept of a cashless society (93.2%), indicating a positive perception towards technological advancements in financial transactions.

Research Question Three: To what level is the perception on harmonization of relevant national databases among staff of Federal University in North Western Nigeria?

TABLE 8:
DESCRIPTIVE RESULTS ON PERCEPTION OF HARMONIZATION OF NATIONAL DATABASES FOR DIGITAL CITIZENSHIP AMONG FEDERAL UNIVERSITIES STAFF IN NORTH WESTERN NIGERIA

Data Harmony	SA F (%)	A F (%)	U F (%)	D F (%)	SD F (%)	M	SD
I believe harmonization of nation database will enhance digital citizenship	196 (50.9%)	165 (42.9%)	24 (6.2%)	0	0	1.5 532	.61 058
I believe when databases are harmonized will bring sanity and full control of citizens	207 (53.8%)	131 (34.0%)	25 (6.5%)	22 (5.7%)	0	1.6 416	.83 936
I believe harmonization of databases will enhance security and reduce crime	204 (53.0%)	133 (34.5%)	4 (1.0%)	44 (11.4%)	0	1.7 091	.95 664
I believe databases harmonization will bring the citizens together in one big family	102 (26.5%)	226 (58.7%)	34 (8.8%)	23 (6.0%)	0	1.9 429	.76 842
I believe in the policy of harmonizing all important national Databases together in the country	127 (33.0%)	194 (50.4%)	41 (10.6%)	22 (5.7%)	1 (.3%)	1.8 987	.82 451
I believe in harmonizing secondary school students' databases with other national databases	114 (29.6%)	193 (50.1%)	27 (7.0%)	50 (13.0%)	1 (.3%)	2.0 416	.95 380
I am aware of these databases NIN, BVN, TIN, License, NECO, JAMB, and WAEC and believe in their harmony	154 (40.0%)	220 (57.1%)	9 (2.3%)	1 (.3%)	1 (.3%)	1.6 364	.57 075
I believe harmonization of databases will facilitate quick information processing and control	184 (47.8%)	174 (45.2%)	23 (6.0%)	2 (.5%)	2 (.5%)	1.6 078	.67 271
I believe harmonization of databases will facilitate information exchange and improve inter-agency operability	191 (49.6%)	182 (47.3%)	9 (2.3%)	2 (.5%)	1 (.3%)	1.5 455	.59 829
Valid N (listwise)	385						

The findings indicate strong support for the harmonization of national databases, with the majority of respondents expressing positive sentiments. Specifically, a significant percentage believes that harmonization enhances digital citizenship (93.8%), brings sanity and control to citizens (88%), enhances security and reduces crime (87.5%), unites citizens in a "big family" (85.2%), and supports the policy of harmonizing all important national databases (83.4%). Additionally, respondents believe in harmonizing school databases with national databases (79.7%) and express awareness and acceptance of various databases (97.1%). The majority also agrees that harmonization facilitates quick information processing and control (93%) and positively impacts information exchange and inter-agency operability (96.9%). Overall, there is a strong consensus on the benefits of harmonizing databases among the participants.

Research Question Four: What is the statistical difference on level of digital citizenship literacy and awareness among Federal University staff in North Western in terms of gender?

TABLE 9:
INDEPENDENT T-TEST IN TERMS OF GENDER

Independent Samples Test in terms of Gender		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	T
DigitalCitizenship Awareness	Equal variances assumed	29.4 92	.000	1.802
	Equal variances not assumed			2.276
DigitalCitizenship Literacy	Equal variances assumed	111. 043	.000	-6.379
	Equal variances not assumed			-4.295

		t-test for Equality of Means		
		Df	Sig. (2-tailed)	Mean Differ ence
DigitalCitizenshipA wareness	Equal variances assumed	383	.072	1.209
	Equal variances not assumed	204.2	.024	1.209
				-7.257
	Equal variances not assumed	92.49	.000	-7.257

On table 9 above, it presented the result of an independent sample t-test to answer the fourth research question which is to assess if there is the statistical difference on level of digital citizenship literacy and awareness among Federal University staff in North Western in terms of gender. The result as shown on the table indicated t= (1.8) meaning no significant gender difference (.072) p<0.05 on the level of awareness, but it indicated t= (-6.3) indicating there was the significant difference (.000) p>0.05 on the level of digital citizenship literacy among staff of Federal Universities in North Western Nigeria.

Research Question five: What is the statistical difference on level of digital citizenship literacy and awareness among Federal University staff in North Western in terms of staff category?

TABLE 10:
INDEPENDENT T-TEST IN TERMS OF STAFF CATEGORY

Independent Samples Test in terms of Staff Category		Levene's Test for Equality of Variances		t-test for Equality of Means
		F	Sig.	T
DigiZenshipAwaren ess	Equal variances assumed	71.2	.000	1.201

		Levene's Test for Equality of Variances		t-test for Equality of Means
	Equal variances not assumed			1.561
DigiZenshipLiteracy	Equal variances assumed	80.2	.000	-5.296
	Equal variances not assumed			-3.977

		t-test for Equality of Means		
		df	Sig. (2-tailed)	Mean Differe nce
DigiZenshipAwarenes s	Equal variances assumed	383	.231	.74264
	Equal variances not assumed	356.0	.119	.74264
DigiZenshipLiteracy	Equal variances assumed	383	.000	-5.6233 1
	Equal variances not assumed	126.1	.000	-5.6233 1

On the table 10 the t-test was to answer the fifth research question which is to assess the statistical differences on the level of digital citizenship literacy and awareness among Federal Universities staff in North Western Nigeria in terms of category of staff. The independent sample t-test result as shown on the table 10 indicated t= (1.201) (0.000) p>0.05 meaning there is no significant difference on the level of awareness, also it indicated t= (-5.296) (.000) p>0.05 indicating there is no significant difference on the level of digital citizenship literacy among categories of staff teaching or non-teaching in the Federal Universities in North Western Nigeria.

Research Question Six: What is the statistical difference on level of digital citizenship literacy and awareness among Federal Universities staff in North Western Nigeria in terms of university?

TABLE 11:
TEST OF HOMOGENEITY OF VARIANCES

		Levene Statistic	df1	df2	Sig.
Digital Citizenship Awareness		3.564	6	378	.002
Digital Citizenship Literacy		9.739	6	378	.000

TABLE 12:
ONEWAY ANOVA TEST IN TERMS OF UNIVERSITY

		Sum of Squares	Df	Mean Square	F	Sig.
DigZenshipAwareness	Between Groups	320.933	6	53.489	**1.82**	**.094**
	Within Groups	11109.4	378	29.390		
	Total	11430.3	384			
DigiZenshipLiteracy	Between Groups	1260.41	6	210.070	**2.28**	**.035**
	Within Groups	34752.0	378	91.937		
	Total	36012.4	384			

The one-way ANOVA test showed no statistically significant difference in digital citizenship awareness among staff of Federal University in North Western Nigeria based on university $(F(6, 378) = 1.820, (p>.05)$ with no significance at (.094). However, there was a statistically significant difference in digital citizenship literacy $(F(6, 378) = 2.285, (p<.05)$ significant at (.035). This indicated the widest gap observed is between FUGUS and FUBK (mean difference = 6.36214*), followed by FUDMA and FUBK (mean difference = 4.56026*), and UDUS and FUBK (mean difference = 4.26089*). Levene's test confirmed homogeneity of variances, supporting the findings.

V. CONCLUSION

The studies collectively contribute a meticulous understanding of digital citizenship, digital literacy, and database harmonization among Federal Universities Staff in North Western Nigeria. Despite variances in focus, common themes of positive awareness, areas for improvement, and the importance of targeted interventions emerged. The robustness of the methodologies, as demonstrated through reliability and validity testing, underscores the credibility of the findings.

Recommendations

For successful attainment of the raised objectives, the followings were recommended, thus:

1. Training Programs: Government should implement training programs to enhance digital citizenship awareness, focusing on ethical online collaboration and responsible technology use.

2. Review of policies: Regular evaluation and update of online usage policies to align with evolving needs and challenges should be given paramount attention.

3. Digital online and Cybersecurity Awareness: Government should launch initiatives to raise awareness about digital online literacy and cybersecurity, emphasizing authentication verification management and safe online practices.

4. Global Citizenship Education: Integrate global citizenship education into university programs to foster awareness of global social issues related to the internet.

5. Tailored Interventions: Develop targeted interventions for all staff in universities with lower participation rates to address specific digital needs.

6. Enhancing Digital Literacy Programs: Strengthen digital literacy programs to refine skills related to information retrieval, critical content evaluation, and effective digital communication.

7. Integration of Technology in Education: Leverage the high level of comfort and proficiency in technology use for educational purposes by further integrating technology into teaching and learning processes.

8. Security Awareness Initiatives: Implement initiatives to educate individuals on best practices for securing digital information, especially regarding financial login details.

9. Clarification on Technology Access: Provide clear communication on the availability of internet and mobile devices at home to address uncertainties expressed by respondents.

10. Promotion of Awareness: Conduct awareness campaigns to educate university staff on the benefits of harmonizing and securing national databases.

11. Inter-agency Collaboration: Facilitate collaboration among relevant government agencies to enhance data harmony, its security and information exchange as well as inter-agency

operability, for actualization of viable digital citizenship.

12. Incorporating Stakeholder Feedback: Seek stakeholder input, especially from dissenting voices, in the development or refinement of policies related to database harmonization.

Future Research

Longitudinal Studies: Conduct longitudinal studies to track changes in digital citizenship awareness, technology adoption, and attitudes towards database harmonization over time.

Comparative Analysis: Compare digital citizenship awareness and perceptions among staff in federal universities across different regions of Nigeria for a comprehensive understanding.

Impact Assessment: Assess the impact of training programs, interventions, and database harmonization on digital citizenship, security, and other identified areas.

Qualitative Exploration: Explore qualitative aspects through interviews or focus groups to gain in-depth insights into participants' experiences and perceptions.

Cross-Cultural Studies: Investigate digital citizenship awareness in a cross-cultural context to understand variations and similarities in different regions or countries.

In summary, implementing these recommendations and pursuing future research avenues will contribute to a more informed and proactive approach to digital citizenship, digital literacy, and database harmonization among Federal University staff in North Western Nigeria.

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