Information Research - Vol. 30 No. iConf (2025)

Digital skills development of university library professionals in Nigeria: testing the UTAUT model

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DOI: https://doi.org/10.47989/ir30iConf47170

Abstract

Introduction. The UTAUT model has been famous for predicting technology usage. This study tested the UTAUT model on the intention to develop digital skills of university library professionals in Nigeria.

Method. Data was collected through questionnaire from 453 respondents and analysed using descriptive and inferential statistics.

Result. Findings revealed that the university library professionals in Nigeria lack digital skills to carry out some operational tasks, especially serials, acquisition and some cataloguing tasks using z39 and OCLC. This study has shed light on the current digital skills level and factors that impede skills development, such as gender, education, years of experience and career cadre, using the UTAUT model.

Conclusion. This study has upheld the validity, consistency, and expansion of the model beyond technology usage to digital skills development intentions. Recommendations were made to library management and related stakeholders in Nigeria to put to consideration the identified factors as guide-light for planning and decision making on digital capacity development for their staff.

Introduction

The COVID-19 pandemic disrupted university library operations globally, forcing many libraries to shut down in compliance with government restrictions. The International Federation of Library Associations (IFLA) advised libraries to transition to virtual services, emphasizing the importance of digital services to continue operations. A comparative study by Adetunla et al. (2023) highlighted that developed countries especially the UK leveraged technology to maintain operations while many university libraries in Nigeria struggled to function due to the absence of a skilled workforce capable of managing digital tools (Ameh et.al, 2021; Kasa & Yusuf 2022). The success of technology deployment in libraries is heavily dependent on the quality of the workforce, which the current Nigerian digital environment lacks (Beer & Mulder 2020; Ajani et.al., 2023). Nigerian library staff need to develop operational digital skills to effectively utilize library management technologies and improve services such as cataloging and metadata, circulation and patron, institutional repository management etc. (Okuongehe & Achugbue 2020; Corrado, 2023).

The UTAUT (Unified Theory of Acceptance and Use of Technology) metamorphosed from TAM (Technology acceptance model) by Davis (1989). This model predicts that perceived usefulness and perceived ease of use positively affect adoption of technology. However, the model experienced changes over the years. According to Venkatesh et al. (2003) eight different models compete to explain the use of technologies, in adapting all models into one, the UTAUT model emerges as an alternative and was later expanded to UTAUT 2 model (Venkatesh et al., 2012). The UTAUT model identifies four key determinants—performance expectancy, effort expectancy, social influence, and facilitating conditions—that affect an individual's intention to use technology. Performance expectancy refers to the belief that using a system will improve job performance, while effort expectancy reflects how easy the system is to use. Social influence relates to the belief that using technology will enhance one's status in a social group, and facilitating conditions are the resources and infrastructure available to support technology use. Also, moderators such as gender, age, experience, and voluntariness play a vital role in shaping technology adoption (Diaz & Loraas, 2010; Chang, 2012; Keong et al., 2012).

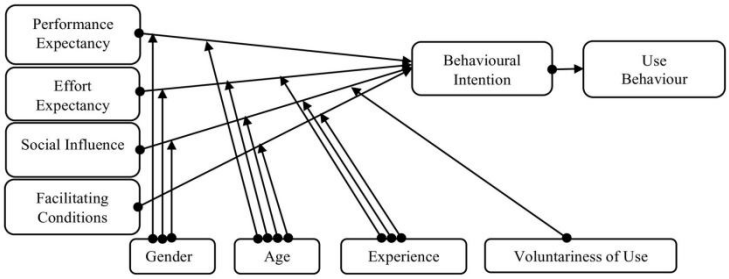

Figure 1. UTAUT model (Venkatesh et al., 2003)

Since the constructs of UTAUT model influence the intention to use technology, this study posits that it should encourage the development of digital skills necessary for technology usage. Research has highlighted that factors such as gender, experience, and IT background are key determinants of the intention to develop digital skills. (Heerwegh et al., 2016; Izuagbe et al., 2019; Couto, 2021; Blut et al., 2022). Arising from on these findings and recognizing that university library professionals in Nigeria lack the digital skills needed to provide services in this digital age, this study aims to explore how the UTAUT model influences the intention to develop digital skills among library professionals. Based on this background, the following research questions and hypotheses were generated:

RQ1. What is the current task-bases digital skills possessed by library professionals in Nigeria.?

RQ2. What are the staff-side factors of the existing digital skill development programs in Nigeria?

H1: there are no gender differences in digital skills level possessed by university library professionals in the use of library automation in Nigeria.

H2: there is no correlation between years of work experience and the level of digital skills possessed by university library professionals in Nigeria for using library automation.

H3: there is no significant correlation between the level of education and the digital skills possessed by university library professionals in using library automation in Nigeria.

H4: there are no significant career cadre differences in the digital skills possessed by university library professionals in using library automation in Nigeria.

Methodology

Research design and sampling technique

This study adopted a survey design using quantitative procedures to collect data through questionnaires. A multi-stage sampling technique was used for this study (see figure 2 below). The first stage involved the use of cluster sampling to put the universities to the 3 geopolitical regions in the South of Nigeria. The second stage involved a random sampling technique to select 3 universities from each region to represent the 3 generations of universities in Nigeria and selection of 3 privately funded universities. and in the third stage, a total enumeration technique was used to sample the 453 professionals (all librarians and library officers) of these 12 universities.

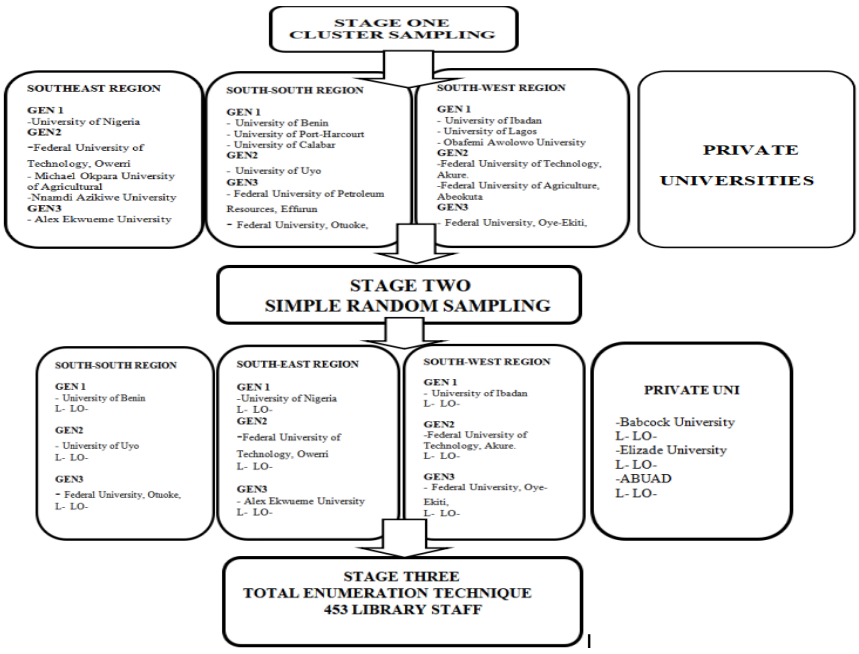

Figure 2. Sampling technique

Quantitative data was collected using structured questionnaires. 453 questionnaires were administered to the respondents across 12 universities in Nigeria; 432 questionnaires were retrieved, and 408 questionnaires were properly filled and found useful for the analysis of this study. Data collected for the study was analyzed using SPSS version 23. T-test of independent sample and Pearson product moment correlation (PPMC) was used to test the hypotheses of the study. The hypotheses were set at 0.05 level of significance.

Presentation of result and discussion

Demographics distribution of respondents

Institution	**FUTA**	**FUTO**	**UNN**	**FU'OYE**	**FU'OTU**	**AEU**	**UNI'BEN**	**UI**	**UNI'UYO**	**BABCOCK**	**ELIZADE**	**ABUAD**	**TOTAL**
Frequency	17	80	78	10	18	22	32	70	30	25	10	16	408
Percentage	4.2	19.6	19.1	2.5	4.4	5.4	7.8	17.2	7.4	6.1	2.5	3.9	100%
Gender	**male**		**female**		**prefer not to say**								
Frequency	168		226		14								408
Percentage	41.2		55.4		3.4								100%
Designation	**Librarian**			**Library Officer**									
Frequency	164			244									408
Percentage	40.2			59.8									100%
Education	**Diploma**			**Bachelors**			**Masters**			**PhD.**			
Frequency	159			156			65			28			408
Percentage	38.9			39.0			15.9			6.9			100%
Work Experience	**0 – 5**			**6 – 10**			**11 above**						
Frequency	83			202			123						408
Percentage	20.3			39.5			40.1						100%

Table 1. Analysis of demographics distribution of respondents

Table 1 shows the demographic analysis of the respondents. Based on institutions, FUTO has the most respondents while Elizade University has the least respondents. Result based on gender shows that there is more female representation. Analysis of designation shows that library officers are more than librarians. Based on their educational qualifications, it was shown that staff that hold Diploma are more, and PhD comes as the least. Analysis of work experience shows that most of the respondents had between 6 to 10 years' working experience.

Research questions

Research question 1: what are the task-based digital skills possessed by university library professionals in Nigeria?

OPERATIONAL TASK DIGITAL SKILLS						
Acquisition operation	Manage vendors	Manage budget	Create purchase order	Manage order/ receipt	Handle purchase suggestions	
$\bar{X}$	1.79	1.84	1.82	1.79	1.71	
SD	.578	.607	.719	.661	.746	
Remark	unskilled	unskilled	unskilled	unskilled	unskilled	
Cataloging	Edit bibliographic records	Manage OPAC	Generate call mark/ accessioni ng	General cataloging	OCLC importing	Z39.50 tool
$\bar{X}$	3.50	3.48	3.45	3.43	1.83	1.75
SD	1.337	1.345	1401	1.418	.684	.728
Remark	skilled	skilled	skilled	skilled	unskilled	unskilled
Serial	Manage subscription	Create new issues/Manage collection	Check subscription expiration	Manage numbering pattern	Claim late issues & manage frequency	
$\bar{X}$	3.43	1.87	3.50	1.91	1.82	
SD	1.416	.650	.1.343	.661	.656	
Remark	skilled	unskilled	skilled	unskilled	unskilled	
Circulation	User registration	Charge & discharge	Renew & prompt due dates	Inter-library operations	Generate reports	Hardware usage
$\bar{X}$	3.37	3.46	3.43	3.47	3.46	3.46
---SD	1.439	1.362	1.400	1.355	1.402	1.366
Remark	skilled	skilled	skilled	skilled	skilled	skilled
Patron	Create new user category	Register new patron profile	Manage/ed it patron account	Staff/patron permission		
$\bar{X}$	3.42	3.40	3.43	3.42		
SD	1.408	1.423	1.393	1.391		
Remark	skilled	skilled	skilled	skilled		

Table 2. Analysis of task-based digital skills possessed by university library professionals in Nigeria

Table 2 shows university library professionals in Nigeria lack digital skills for acquisition and serials tasks. While they possess some skills for cataloging tasks, it is evident they are not skilled in using the Z39.50 tool and OCLC. However, they are skilled in the circulation and patron tasks. The extent of automation in the university libraries in Nigeria shows the level of contact the professionals have with the various operations of their library management systems hence the reason for an average level of skill in cataloging and circulation routine and a low level of skill in the other library routine they are less exposed to such as acquisition and serial routines (Ajani & Buraimo, 2021).

Research question 2: what are the staff-side factors that impede the existing digital skill development programs for university library professionals in Nigeria

Challenges of Digital Skills	N	$\bar{X}$	SD	Remark
Personal factors				
I have phobia for computers and technology	408	1.40	.583	Disagree
My age affects the use of computers and technology	408	1.66	.532	Disagree
My religious belief is averse to the use of computers	408	1.70	.561	Disagree
I have health challenges that requires me to avoid technology	408	1.70	.568	Disagree
I am not financially buoyant to afford training	408	3.86	.621	Agree
My formal LIS training excluded training on digital technology	408	3.65	.624	Agree
Gender related factors				
Family commitments give me little time for training	408	3.67	.649	Agree
My marriage reduces my digital skills training opportunity	408	3.65	.670	Agree
My gender provides little opportunity for digital skills training	408	3.41	1.422	Agree
Organizational factors				
My rank in the office reduces my training opportunities	408	1.66	.672	Disagree
I am rarely promoted and there is no need to attend any digital skills training	408	1.39	.581	Disagree
My library management does not encourage digital skills training	408	3.67	.649	Agree

Table 3. Staff-side factors that impede the existing digital skill development programs for university library professionals in Nigeria

Personal factors: library staff reported that their prior formal library school education lacked courses on digital library technologies. This curriculum gap is a barrier to developing digital skills. Many library schools still offer outdated courses, and even where digital courses exist, they tend to be theoretical due to a lack of practical facilities and qualified instructors. Ikolo and Nongo (2022) assert that same is still the case. Also, staff members often cannot afford self-sponsored digital training, particularly when international training opportunities require travel and foreign currency expenses, making it difficult for those from developing countries like Nigeria to access these opportunities. Aregbesola et.al, (2019) alluded that the challenge of affordability caused by foreign exchange subsumes most developing countries. Additionally, gender-related challenges, particularly for women in developing countries especially Africa, affect their ability to develop digital skills. Female professionals in Nigeria are faced with care-giving responsibilities (e.g., childbirth and family care), which often lead to career interruptions and limit their opportunities for digital skills development compared to their male counterparts (Adjah & Walt, 2019; Akhtar & Soroya, 2021).

Organizational factors: many library staff perceive a lack of commitment from university library management to support digital skills development. There is limited financial backing for training programs, with staff development often not prioritized. Akintola et.al. (2022) alluded that library personnel in the universities perceived that library management was not committed to capacity building as there is irregular sponsorship for training from their university. Due to economic challenges facing the universities and low budgetary allocations for staff development, university libraries struggle to sponsor training programs for their staff. Additionally, the non-payment of salaries affects staff morale and further discourages participation in training opportunities. Mapulanga (2014) observed that the dwindling economy in most developing countries and especially in Nigeria has put the universities management in financial quagmire of meeting their obligations on training and wages payment (Vanguard Newpaper, 2024). Even when training

opportunities come, non-payment of salary affects their morale and motivation to attend training programs.

Hypotheses

Hypothesis 1: there are no significant gender differences in digital skills level possessed by university library professionals in Nigeria.

Gender	**N**	**Mean**	**SD**	**Df**	**$t_{(cal)}$**	**$t_{(tab)}$**	**Decision**
Male	168	3.72	1.321	392	4.32	1.96	S
Female	226	3.43	1.285				
P<0.05 level of significance					*S = Significant*		

Table 4. T-test analysis of gender difference in digital skills level possessed by university library staff in the use of library automation in Nigeria

Table 4 revealed that there was significant gender difference in digital skills level possessed by library staff in Nigeria. The result shows that male professionals have more digital skills than the women professionals. This outcome aligns with the findings of Deyrup (2014) and Ashiq and Warraich (2023) who identified that one of the challenges of female professionals in the libraries is lack of digital skills and the digital space is gradually moving towards masculinity. Golub and Jose (2009) analyzed the professional trends and reveals a new pattern of dual career tracking in which men are associated with technology and women with management.

Hypothesis 2: there is no significant correlation between the years of work experience and digital skills level possessed by library staff in the use of library automation in Nigeria.

Correlations			
		Work Experience	Digital Skills Level
Work Experience	Pearson Correlation	1	.050
	Sig. (2-tailed)		.310
	Sum of Squares and Cross-products	202.078	7.392
	Covariance	.497	.018
	N	408	408
Digital Skills Level	Pearson Correlation	.050	1
	Sig. (2-tailed)	.310	
	Sum of Squares and Cross-products	7.392	106.586
	Covariance	.018	.262
	N	408	408

T-test analysis of difference in the years of experience between 0 to 10 years and 11 years and above

Years of Experience	**N**	**Mean**	**SD**	**df**	**$t_{(cal)}$**	**$t_{(tab)}$**	**Decision**
0 – 10	285	3.75	1.497	406	2.87	1.96	S
11 years and above	123	3.40	1.172				

P<0.05 level of significance *S = Significant*

Table 5. Analysis of correlation between the years of work experience and digital skills level possessed by library staff in the use of library automation in Nigeria

Table 5 revealed a significant positive correlation between years of work experience and the digital skills level of library staff in Nigeria. Further t-test analysis revealed that library staff with 0 to 10 years of experience possess higher digital skills than those with 11 years and above. This is significant because most of the study's participants fall into the 0 to 10 years category, suggesting that many of them are younger, possibly digital natives, who interact more frequently with technology in their daily work. In contrast, the group with over 10 years of experience primarily represents the library leadership, responsible for decision-making. The study highlights that the library leadership in Nigerian universities may lack the necessary digital skills due to outdated prior library school training which were not aligned with the demands of the current digital environment. This has left the leadership underprepared to address the challenges posed by new technologies (Ariole et al., 2017; Olubiyo, 2022).

Hypothesis 3: there is no significant correlation between the level of education and digital skills level possessed by library staff in Nigeria.

Hypothesis 4: there is no significant difference in the career cadre on the digital skills level possessed by library staff in Nigeria.

Correlations			
		Level of Education	Digital Skills Level
Level of Education	Pearson Correlation	1	.055
	Sig. (2-tailed)		.268
	Sum of Squares and Cross-products	221.490	11.863
	Covariance	.544	.029
	N	408	408
Digital Skills Level	Pearson Correlation	.055	1
	Sig. (2-tailed)	.268	
	Sum of Squares and Cross-products	11.863	210.578
	Covariance	.029	.517
	N	408	408

T-test analysis of difference in the career cadre

Career Cadre	**N**	**Mean**	**SD**	**df**	**$t_{(cal)}$**	**$t_{(tab)}$**	**Decision**
Librarian	12	2.25	.452	406	3.029	1.96	S
Library Officer	396	1.73	.592				

P<0.05 level of significance *S = Significant*

Table 6. Analysis of correlation between the level of education and digital skills level possessed and t-test analysis of difference in the career cadre and the digital skills level possessed by library staff in Nigeria

Table 6 indicates a significant positive correlation between the level of education and the digital skills level of library staff in Nigeria. This suggests that higher levels of formal education contribute to better digital skills. The study also distinguishes between two career cadres: librarians and library officers and reveals a significant difference in digital skills between these two groups, with librarians possessing higher levels of digital skills compared to library officers. Librarians typically hold at least a bachelor's degree in library and information science or a related field, while library officers have a diploma in the same field. These findings align with Inyang and Mngutayo (2018) and Ibegbulam and Eze (2016), who noted that formal education is a key avenue for acquiring the required skills and so, paraprofessionals, like library officers, tend to have lower digital skills.

Connecting the findings to the UTAUT

Figure 3 shows a self-developed adaptation of the UTAUT model based on the findings of this study.

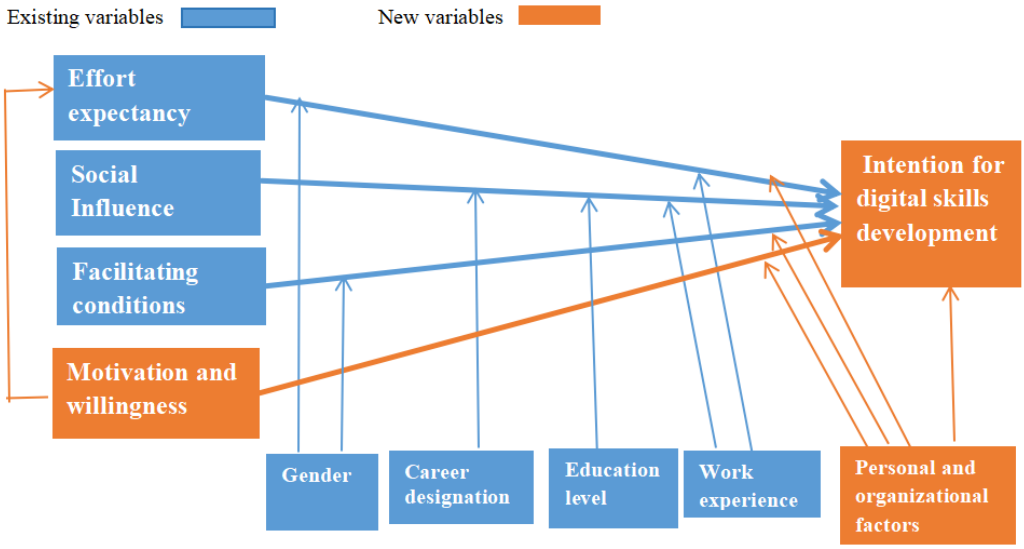

Figure 3. Shows a self-developed adaptation of the UTAUT model

Effort expectancy: this concept refers to the ease with which library professionals can use technology operational tasks. To improve the ability to use technology with ease, digital skills development is essential. Gender, work experience and organizational factors were found to be significant moderating factors. Female staff and those with more years of experience exhibiting lower digital skill will hinder task. Also, lack of motivation and incentives from the organization influence willingness to develop skills which is crucial for operational use of technology.

Social influence: social influence pertains to how career position, education, and social status can affect technology use. The study highlights that staff with higher education levels, particularly senior staff (librarians with master's or PhD qualifications), are more skilled in using technology than those with lower educational qualifications. Career cadre and education level were identified as moderators of social influence, impacting the intention to develop digital skills.

Facilitating conditions: conditions such as technical infrastructure, organizational support, and personal factors (e.g., financial stability, health, willingness to learn) are essential to overcoming barriers to digital skills development. Gender-related challenges (e.g., care-giving responsibilities) and organizational factors (e.g., incentives, remuneration) also play a significant role in influencing staff's intention to develop digital skills.

Motivation and willingness: this new emergence highlights the importance of addressing personal and organizational concerns to increase staff motivation and willingness to improve their digital skills. Key factors like financial stability, timely payment of wages, workplace gender-related issues, and promotion opportunities play a significant influence on digital skills development.

Conclusion and recommendations

The study demonstrates that the UTAUT model remains relevant in understanding technology adoption, especially in the context of digital skills development within the library and information field. This study has tested the UTAUT in a different but similar terrain by extending the discussion beyond technology usage to digital skills development. This study has upheld the validity, consistency, and expansion of the model, introducing new moderating factors such as personal and organizational commitments, as well as variables such as motivation and willingness, which enhance digital skills development. Beyond theory, this study has shed light on the gaps and barriers to digital skills development among Nigerian university library professionals, addressing

these gaps will enable university libraries in Nigeria to provide up-to-date digital services and ultimately improving the quality of education and research output in Nigeria. Following recommendations are made:

Policy and planning: library administrators and relevant stakeholders should consider the identified factors impeding digital skills development to guide policy formation, planning, and decision-making.

Institutional action: university library administrators should conduct a detailed analysis of the digital skills needs within their institutions and implement tailored training methods to address the specific skill gaps among staff.

Gender equity in training: there should be a focus on providing equitable digital skills development opportunities for female professionals, addressing gender-related barriers to advancement.

Staff motivation: university management should prioritize staff motivation, ensuring that factors such as financial incentives, career progression, and recognition are in place to encourage staff to develop the digital skills necessary for enhancing their performance and the overall output of the institution.

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