## ICT SKILLS: AN IMPERATIVE FOR INCREASED RESEARCH PRODUCTIVITY OF ACADEMIC LIBRARIANS IN SOUTH-WEST NIGERIA

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#### Abstract

The paper highlights the crucial role of Information and Communication Technology (ICT) skills in enhancing research productivity. In today's rapidly evolving digital landscape, ICT proficiency has become indispensable for researchers across various disciplines. This paper explores the significance of ICT skills in optimizing research processes, fostering collaboration, and accessing a wealth of information and tools. It underscores the relationship between ICT competency and research output, emphasizing the need for researchers to acquire and refine their ICT skills. The research revealed that ICT skills has a significant influence on research productivity of academic librarians in South-West, Nigeria  $(R^2 = 0.126, \beta = -0.354, t(325) = -6.822; p < 0.05)$ . Specifically, reference citation management skill (Beta= -0.184, t(320) = -2.362, p<0.05) and academic social networking skill (Beta = -.171, t(320) = -2.024, p < 0.05) contribute significantly to the research productivity of academic librarians in South-West, Nigeria. The study concluded that ICT skills enhanced research productivity of academic librarians in South-West, Nigeria. The findings of this paper contribute to the growing discourse on the pivotal role of technology proficiency in shaping the future landscape of research productivity. The study recommended that University administrators should put in place policies, processes and procedures that boost the research productivity of academic librarians especially by providing the necessary *ICT* software and hardware required for research.

Keywords: Academic Librarians, ICT Skills, Research Productivity

#### Introduction

ICT has encroached on virtually all human endeavours, hence the need for versatility in its usage. ICT is all-pervading and encapsulates a blend of various technologies. ICT skills are part of the twenty-first-century core competencies which academic librarians must master to effectively and efficiently handle research and all related tasks and for boosting their research productivity (Madu, Idoko, Dirisu & Emerole 2024). The proliferation of various ICT research tools has improved how research is conducted and also transformed the process of research irrespective of discipline/subject area (Kashorda & Muia, 2013). Hence, the need for learning and acquisition of new skills. These ICT skills can be useful at different stages of

the research process, at the pre-data analysis stage, analysis stage or post data analysis stage. ICT skills are important assets necessary for maximizing these abundant ICT tools available for optimal publication output. Some ICT skills that academic librarians should possess include but not limited to basic operational skills, navigation skills, safety and security skills, statistical and online survey skills, social networking skills, citation and reference management skills.

Basic operational skills are pertinent and foremost skills that any ICT user should have. According to Ayanso, Cho and Lertwachara (2014), it entails the ability to carry out basic operational tasks that shows that one has an elementary knowledge of computers. Basic computer skills includes the ability to, start and shut down a computer, run application, ability to type and save documents using tools like word processors, grammar and spell checkers to correct grammatical mistakes and many more. When a researcher does not have adequate basic skills, they are left with no choice but to outsource their manuscript production to others. This may lead to delay in producing research, invariably affecting the quantity that the researcher could have produced in a given year. Also, the ability to open an email account, send and receive manuscripts through e-mails and do many more with e-mail is an essential skill for any researcher. Some editors or reviewers communicate via e-mail and also expect any author to be able to respond as required. Without this skill, a researcher's progress may be hindered (Iordache, Mariën, & Baelden, 2024).

Doing literature review is a basic and major part of social science research work. Possessing adequate skills and ability to navigate the World Wide Web and the internet enables a researcher to access rich and up-to-date literature on the subject of interest. Skill is what makes the difference in outcome of using academic search engines, with the right skill and connection to the internet, a researcher is just clicks away from receiving rich, voluminous and valuable information on any imaginable topic. It is essential for academic librarians as researchers to possess the ability to use diverse search engines and a plethora of existing academic search engines that abound on the internet (Oguche, 2017). Consequently, Ability to use the internet for literature searches at the researchers' own convenience 24 hours in a day can help researcher to access information which could aid completion of research at a significantly faster rate. Beyond retrieving relevant literature for research, many journal publishers only receive manuscripts and communicate with authors via their journal portals (Hoskins, 2013). A researcher should possess skills for navigating the publisher or journal portal so as to submit manuscripts, check editor's comments, manuscript status and many more. If a researcher cannot navigate these portals, then he/she may not be successful at publishing with such outlets (Cavaliere, 2024).

Additionally, safety and security skills are essential skills that a researcher should possess. Part of safety and security skills is the ability to backup data using any storage device e.g. compact disk, computer hard disk, external hard drive, cloud storage and many more. When a researcher does not have this skill, all the labour that went into a research work can become a waste in a matter of seconds if he loses data and cannot retrieve them. The

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ability to use software packages to statistically analyze is essential and inevitable for academic librarians like many other researchers. Depending on someone else to do this would mean being at the person's mercy especially in terms of time. He/she would do it at their convenient time and this could adversely affect timeliness, sometimes a research analysis done by someone else is not easy to interpret and thereby eliciting doubts and questions from reviewers. It is also important for researchers to possess the ability to develop, administer and retrieve research instruments using ICT.

Also, the ability to use citation and reference management software e.g. EndNote Basic, Mendely, Zotero, RefWorks and many more to do in-text citation, to select and adapt citation styles as requested by reviewers, to automatically populate the references or bibliography and many more task, allows researchers to do research faster resulting in quick completion (Sud & Thelwall, 2016). This is expected to lead to increased research output. Citation and reference management skills also involves the ability to use plagiarism checker software e.g. Dupli Checker, Copyleaks, PaperRate, Turnitin, etc. ability to use these software may lead to fewer cases of plagiarism (Biagioli, 2012). This software can help researcher to improve the originality of a manuscript by pointing out grey areas requiring proper citation thereby increasing the chances of its acceptance by reviewers (Asmi, & Madhusudhan, 2024).

Furthermore, proficiency in the use of social networking tools is also an essential ICT skill for academic librarians especially as it expands the possibilities of informal communication, collaboration and knowledge gathering by researchers from anywhere through any device of their choice especially mobile devices. With adequate academic social networking skills, researchers can keep track of research activities of their interest, track upcoming related literature and stay connected with their professional networks and share huge quantities information which are a bonus for researchers (Gruzd, Staves, & Wilk, 2012).

#### **Statement of the Problem**

The process of research, like every other aspect of life, has experienced significant changes since the emergence of ICT. With advancements in ICT, research workflow continues to evolve and change .The benefits of ICT notwithstanding, some studies have reported that there are gaps between the skills taught in many LIS schools and the actual ICT skills required to function on the job as academic librarians (Singh & Mehra, 2013). Adeagbo, van Deventer, Asubiojo and Pienaar (2016) reported that researchers in Nigeria have a low level of awareness and usage of ICT for research purposes. Ayoku, and Okafor (2015) revealed that many of the librarians they investigated were skillful at the use of email and word processors but were not aware of other search engines apart from Google. Also, the librarians were not aware of some specialized databases and some open-access library databases. ICT skill is commonly measured by eliciting the self-perception of the respondent. While LIS literature is replete with ICT use by librarians, there appears to be a dearth of literature which examines ICT skills of librarians in terms of research. A number of

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existing literature have assessed how academic librarians use ICT to provide services to their users, however, not much research has been carried out to examine the extent of skillfulness of academic librarians in ICT use for their research activities.

#### **Research Question:**

1. What is the level of ICT skills of academic librarians in South-West Nigeria?

#### Hypothesis

**Hypothesis 1:** ICT skills have no significant influence on the research productivity of academic librarians in South-West Nigeria

**Hypothesis 2:** There is no relative significant influence of ICT skills indicators (basic operational skills, navigation skills, safety security skill, online survey statistics skill, reference citation management skill, and academic, social networking skill) on the research productivity of Academic Librarians in South-West, Nigeria

#### **Literature Review**

ICT skills entails the capability and ability to perform detailed or work-related tasks (cognitive skills), items (technical skills) or individuals (interpersonal skills) with a deliberate, consistent and sustained effort. Information and Communication Technologies have resulted in a need for learning new skills. Ainley, Schulz, and Fraillon (2016) suggested that there is a huge gap and disparity in the extent to which people access technologies and its availability between and within countries. They argue that proficiency in using and managing ICTs is one of the conditions that determines whether people can effectively employ the numerous ICT tools available. The rates at which researchers utilize ICTs have been reported to have an impact on the output level of research (Moahi, 2009). The use of ICT for research work has been found to vary depending on the discipline.

Every discipline exhibits distinct habits as regards the areas of ICT use in research. ICT plays a significant role in research by academic librarians as noted by Birnholtz (2007). Virtually all stages of research process require ICT use, whether at the pre-data analysis stage, data analysis stage or post data analysis stage (Fung, 2013). Ability to use ICT in predata analysis stage of research involves literature search, tracking, developing, administering and collection of research instruments. At the data analysis stage, ICT is deployed for the qualitative or quantitative analysis with assistance of statistical packages, transcription technologies among others. The post-data analysis stage covers the compilation of references and bibliography, plagiarism checking and detection, manuscripts submission. The use of ICTs have become the reality for all types of research. Arcila-Calderón, Calderín and Aguaded (2015) assert that the advent of ICT has revolutionized many traditional processes or stages of research and has provided efficient and effective ways of carrying out research. Supporting the assertion, Roh (2016) stated that scholarly communication system is in a state of rapid transit and advancement and is being driven by current technologies.

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The ability to undertake and successfully publish research using ICT tools has increased. It has become necessary to have some technology skills to perform research. ICT has the ability to ease the process of knowledge-gathering and many other stages of research in very creative ways, hence, it has been linked to increased research productivity. The possession of ICT skills carries the potential to make research more effective and efficient leading to its quick completion (Kumar, 2013). With the right skills in the use of ICTs for research, the researcher will be able to save time and money that could have hitherto been spent during and after research. For instance, the right ICT skills will enable researchers to gather data at a low cost from thousands of subjects (American Psychological Association, 2016). ICT reduces the difficulty in obtaining information resources or data which used to be a challenging and difficult task in the past.

The level of skills required to harness ICT can range from simple to highly complex, powerful and specialized. From literature, ICT skills have been categorized into various types and levels. Some posit that ICT skills range from "weak" to "strong". Where the strong possess ability to use advanced high-speed computer networks, large datasets, and specialized research tools. The weak is the ability to use email, web browsers, spreadsheets and other general-purpose software and not specific tools or software. (Markauskaite & Wardak, 2015; Tansley & Tolle, 2009).

Also, Alexander, Holmner, Lotriet,.. and Jordaan, D. (2011) simply grouped ICT skills into basic skills and advanced skills. Other scholars classified ICT skills into three (3) i.e. basic skills, medium level skills and advanced level skills (Atasoy, Banker & Pavlou, 2012). Likewise, Akoojee, Arends and Roodt (2008) stated that the grouping for ICT skills level for developing countries be in three stages i.e. lower or basic ICT, intermediate ICT skills and higher level / advance ICT skills. The lower or basic ICT skills includes ability to do basic data processing and analysis using word processor etc. Intermediate ICT skills comprise the ability to extensively accomplish required functions/task using ICT tools whereas higher /advance ICT skills level comprise the ability to be highly knowledgeable in software and hardware development and maintenance. The benefits of ICT notwithstanding, some studies have reported that there is a gap in terms of ICT skills taught in many library and information science schools and the actual ICT skills required to function on the job as librarians (Bosque & Lampert, 2009; Singh & Mehra, 2012).

#### Methodology

The population for this study was three hundred and eighty-five (385) academic librarians from public and private universities in the South-West region of Nigeria, comprising Lagos, Ogun, Oyo, Osun, Ondo and Ekiti. Complete enumeration was used thereby eliminating the need for sampling. The instrument used for collecting data for the purpose of this study was a self-designed questionnaire. Self-developed semi structured Questionnaire was used as the instrument for data collection. The data collected was presented and analyzed using descriptive and inferential statistics in order to obtain the

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relevant answers to the research question and hypotheses. This enabled the researcher present a consistent and understandable interpretation of the data collected. The Statistical Package for Social Sciences (SPSS) Version 23was used to analyze.

#### Results

# Research Question 1: What is the level of ICT skills of academic librarians in South-West Nigeria?

Table 1 Level of ICT skills of academic librarians

ICT Skill Set		Skill Level						
S/N	Basic Operation Skills	VH	Н	AV	L	VL	MEAN	SD
		N%	N%	N%	N%	N%		
1	My ability to start and shut down a computer correctly is	259 (79.4)	61 (18.7)	5 (1.5)	0 (0.0)	1 (0.3)	4.76	0.50
2	My ability to run the application from the desktop or through the start menu is	238 (73.0)	64 (19.6)	19 (5.8)	2 (0.6)	3 (0.9)	4.63	0.71
3	My ability to type using a computer is	230 (70.6)	68 (20.9)	26 (8.0)	2 (0.6)	0 (0.0)	4.61	0.66
4	My ability to open a file and use the save and save As options	247 (75.8)	64 (19.6)	14 (4.3)	0 (0.0)	1 (0.3)	4.71	0.60
5	My ability to cut, copy and paste within and between folder or files	245 (75.2)	63 (19.3)	10 (3.1)	6 (1.8)	2 (0.6)	4.67	0.69
6	My ability to create, open, edit, and print documents	242 (74.2)	67 (30.6)	10 (3.9)	5 (1.5)	2 (0.6)	4.66	0.67
7	My ability to use the basic features of MS such as spell-checker, font types and sizes, headings, emphasis, justify, etc.	225(69.0)	74(22.7)	22 (6.8)	4 (1.2)	1 (0.3)	4.59	0.70
8	My ability to import images, graphs or charts into an MS document	203 (62.3)	76 (23.3)	32 (9.8)	14 (4.3)	1 (0.3)	4.43	0.86
	Average Mean						4.65	
	Navigation Skills							
9	My ability to use online databases	205 (62.9)	90M(27.6)	23 (7.1)	8 (2.5)	0 (0.0)	4.51	0.73
10	My ability to create an email account	228 (69.9)	83 (25.5)	13 (4.0)	1 (0.3)	1 (0.3)	4.64	0.60
11	My ability to send and receive emails	245 (76.1)	61 (18.7)	17 (5.2)	0 (0.0)	0 (0.0)	4.71	0.56
12	My ability to attach files and open attachments	244 (74.8)	62 (19.0)	12 (3.7)	7 (2.1)	1 (0.3)	4.66	0.68
13	My ability to use search engines to obtain needed information	229 (70.2)	79 (24.2)	14 (4.3)	3 (0.9)	1 (0.3)	4.63	0.64

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14	My ability to save pages from the Internet	220 (67.5)	82 (25.2)	22 (6.7)	2 (0.6)	0 (0.0)	4.60	0.64
15	My ability to use publisher/ journal portal for all the processes of manuscript submission, tracking through to publication	188 (57.7)	85 (26.1)	43 (13.2)	5 (1.5)	5(1.5)	4.37	0.88
16	Respondents ability to find information about academic papers, authors, conferences, journals, and organizations from multiple sources	189 (58.0)	96 (29.4)	29 (8.9)	5 (1.5)	7 (2.1)	4.40	0.88
17	My ability to copy text and graphics from web pages	183 (56.1)	90 (27.6)	41 (12.6)	6 (1.8)	6 (1.8)	4.34	0.90
	Average Mean						4.54	
ICT Sk	ill Set	Skill Level						
S/N	Safety and Security skill	VH	Н	AV	L	VL	MEAN	SD
		N%	N%	N%	N%	N%		
18	My ability to use storage/ backup technologies, e.g. hard disk, compact disk, flash drive etc.	182 (55.8)	109 (33.4)	28 (8.6)	2 (0.6)	5 (1.5)	4.41	0.80
19	My ability to back up my data using cloud storage	139 (42.6)	113 (34.7)	55 (16.7)	10 (3.1)	9 (2.8)	4.11	0.98
	Average Mean						4.26	
	Online Survey / Statistics Skill							
20	My ability to administer and retrieve questionnaires using online, web-based or internet survey tools, e.g. Google forms, SurveyMonkey	60 (18.4)	62 (19.0)	111 (34.0)	62 (19.0)	31 (9.5)	3.18	1.21
21	My ability to do statistical manipulations using SPSS	54 (16.6)	24 (7.4)	88 (27.0)	85 (26.1)	75 (23.0)	2.44	1.24
	Average Mean						2.81	
	Academic Social Networking Skill							
22	The respondents' ability to create academic, social network account, e.g. Research Gate, Academia.edu among others	23 (7.1)	8 (2.5)	92 (28.2)	101 (31.0)	102(31.3)	2.81	1.03

24	My ability to use academic, social networking sites for seeking comments from subject matter experts	19 (5.8)	10 (3.1)	120 (36.8)	84 (25.8)	93 (28.5)	2.68	1.02
25	My ability to use academic, social networking sites to monitor papers published	24 (7.4)	14 (4.3)	118 (36.2)	84 (25.8)	86 (26.4)	2.62	1.08
26	My ability to use academic, social networking sites to follow scholarly works	25 (7.7)	13 (4.0)	98 (31.6)	87 (26.7)	103(31.6)	2.70	1.07
27	My ability to use social media tools for research collaboration	25 (7.7)	15 (4.6)	101(31.0)	86 (26.4)	99 (30.4)	2.46	1.09
	Average Mean						2.67	
	Reference /Citation Management skill							
28	My ability to integrate reference management software with word processors to enable in-text citation	36 (11.0)	17 (5.2)	129 (39.6)	62 (19.0)	82 (25.2)	2.42	1.08
29	My ability to carry out plagiarism tests	45 (13.8)	17 (5.2)	132 (40.5)	64 (19.6)	68 (20.9)	2.36	1.10
30	My ability to use citation or reference management software to populate the references or bibliography automatically	41 (12.6)	23 (7.1)	121 (37.1)	65 (19.9)	76 (23.3)	2.37	1.14
	Average Mean						2.38	
	Overall Mean Score						3.55	

VH= Very High; H = High; AV = Average; L = Low; VL = Very Low.

Source: Field survey, 2021

Table 1 shows that the ICT skills of academic librarians in South-West Nigeria is high judging by the overall mean score of 3.55 on the scale of 5. It was observed that the respondents' basic operational skill is very high going by the mean score of 4.65. This implies that the respondents possessed adequate skills for carrying out basic tasks for instance using the basic features of Microsoft such as spell-checker, font types and sizes, headings, emphasis, justify (mean = 4.59, Std. Dev. = 070). In terms of navigation skill, the respondents indicated that their ICT skill is very high as revealed by the average mean of 4.54. This also implies that the respondents have adequate skills for sending and receiving emails (mean = 4.71, Std. Dev. = 0.60), attach and open file attachments (mean= 4.66, Std. Dev. = 0.68). Also, in terms of safety and security skills, the results indicated that the

respondents' skill in this wise is also very high as indicated by the mean score of 4.26. This suggests that the respondents can adequately use storage/ backup technologies (mean= 3.18, Std. Dev. = 1.21). However, the respondents' online survey/statistics skill was low judging by the mean score of 2.81. The results reveal that respondents' ability to administer and retrieve questionnaires using online, web-based or internet survey tools. In addition, the results show that the respondents' capability to do statistical manipulations using software. This suggests that respondents do not have the ability to do statistical manipulations using SPSS.

The results showed that respondents' academic social networking skill was low with a mean score of 2.67. The results show that respondents' ability to create academic, social network account was low (mean =2.81, Std. Dev. = 1.03). This suggests that respondents' ability to effectively use academic social networks for research work was inadequate.

Also the respondents had a low level of reference / citation management skill as shown by the average mean of 2.38. The researcher attempted to find out if the respondents can use citation or reference management software to populate references or bibliography automatically. The result shows that the respondents' ability to carry out the task was low with a mean score of 2.37 and standard deviation of 1.14. This suggests that respondents lack the ability to use citation or reference management software to populate the references or bibliography automatically. The academic librarians' ability to integrate reference management software with word processors to enable in-text citation was low, with a mean score of 2.42 and standard deviation of 1.08. This also suggests that respondents lack the ability to integrate reference management software with word processors to enable in-text citation (mean =2.42, Std. Dev. =1.08). The researcher also wanted to find out if the respondents have the ability to carry out plagiarism tests and found that the respondents' ability to do this is also low with a mean score of 2.36 and standard deviation of 1.10. This suggests that respondents could not use necessary software to carry out plagiarism tests. In all, the results suggest that academic librarians do not have the ability to manipulate reference / citation management software. **Hypothesis** 1

## ICT skills have no significant influence on the research productivity of academic librarians in South-West Nigeria

Test of hypothesis one focused on the influence of ICT skills on research productivity. To find out whether ICT skills have a significant influence on the productivity of Academic Librarians in the selected institutions, a linear regression analysis was computed as depicted below.

Table 2: Simple linear	regression	analysis of ICT	' skills and	research productivity
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	<b>Coefficients</b> <sup>a</sup>								
Model	Unstar Coef B	ndardized ficients Std. Error	Standardized Coefficients Beta	t	Sig.	R <sup>2</sup>	Adj. R <sup>2</sup>	F	ANOVA (Sig.)

(Constant)	5.376	.261	20.60 3	.000	0.126	0.123	46.541	.000
ICT Skills	442	.065	354 -6.822	.000				

a. Dependent Variable: Research Productivity

#### b. Predictor: ICT Skills

Hypothesis one was tested with simple linear regression analysis to find out the influence of ICT skills on the productivity of academic librarians. The result of Table 2 (a) shows that ICT skills (Beta =-0.354, t = -6.822, p < 0.05) had a significant and negative influence on research productivity of academic librarians in South-West, Nigeria. Therefore, the null hypothesis (H<sub>02</sub>) was rejected. The R<sup>2</sup> (0.126) of the regression model indicates that 12.6% of the change in research productivity is explained by ICT skills. The F(1, 325) = 46.541, p < 0.05 shows that the regression model can be used in predicting research productivity of academic librarians when adequate attention and planning are offered by management of academic libraries in South-West Nigeria.

# Hypothesis 2 There is no relative significant influence of ICT skills indicators (basic operational skills, navigation skills, safety security skill, online survey statistics skill, reference citation management skill, and academic, social networking skill) on the research productivity of Academic Librarians in South-West, Nigeria

Test of hypothesis two focused on finding out whether the indicators of ICT skills have a significant influence on the productivity of Academic Librarians in the selected institutions. A multiple linear regression analysis was computed as depicted in Table 3.

 Table 3: Multiple linear regression analysis of ICT skills (indicators) and research productivity

ICT Skills	Unstandardize	d Coefficients	Standardized Coefficients	t	Sig.	
	В	Std. Error	Beta			
(Constant)	4.587	.367		12.491	.000	
Basic operational Skills	032	.125	021	251	.802	
Navigation Skills	.151	.133	.110	1.135	.257	
Safety Security Skill	123	.074	156	-1.671	.096	
Online Survey Statistics Skill	.028	.067	.037	.420	.675	
Reference Citation Management Skill	189	.080	184	-2.362	.019	
Academic Social Networking Skill	145	.072	171	-2.024	.044	
Model Summary and ANOVA						
R-value			361			
R-Squared			131			
R-Squared (Adj.)	.114					
F-value		7	7.989			

P-value	.000
DF	6, 311

Dependent Variable: Research Productivity

Predictors: (Constant-ICT Skills), Basic operational Skills, Navigation Skills, Safety/security Skill, Online Survey Statistical Skill, Reference Citation Management Skill and Academic Social Networking Skill The influence of ICT skills (basic operational skills, navigation skills, safety security skill, online survey statistics skill, reference citation management skill, and academic, social networking skill) on the productivity of academic Librarians was analyzed using multiple linear regression analysis in Table 3. The result shows that ICT skills (dimensions) jointly contribute 11.4% (Adj.  $R^2=0.114$ ) to the variation in research productivity of academic librarians in South-West, Nigeria (F (6,311) = 7.989, p < 0.05). Individually, reference citation management skill (Beta= -0.184, t = -2.362, p < 0.05) and academic social networking skill (Beta = -.171, t =-2.024, p < 0.05) contribute significantly to the research productivity of academic librarians in South-West, Nigeria. The highest contributor to research productivity is reference citation management skill. On the other hand, basic operational skills (p > 0.05), navigation skills (p > 0.05), safety security skill (p > 0.05) and online survey statistics skill (p > 0.05) were insignificant predictors of research productivity of academic librarians. This result provides insight to the relative importance of reference citation management skill and academic social networking skill in addressing the issue of research productivity among academic librarians in South-West, Nigeria.

#### Conclusion

In conclusion, there is no denying that ICT skills have an influence on research productivity. ICT expertise is essential for academic librarians to undertake more productive research. In today's digital age, researchers with strong ICT skills are better equipped to sift through the massive amount of information available. Academic librarians with ICT skills can efficiently access and utilize a wide range of digital materials and databases. They can utilize sophisticated search methods to quickly identify relevant material, saving time and effort while conducting research. Furthermore, ICT-savvy librarians can properly organize and categorize digital collections, ensuring that users have quick access to content. They can collaborate effectively with peers, analyze and process data fast, and present their findings to a larger audience. It is now necessary for librarians to be well-versed in ICT in order to fulfill their research obligations which will enable them advance in the career ladder as well as help them to support and assist faculty and students in their academic community with their research needs.

#### Recommendations

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

1. To bolster the ICT skills of academic librarians in South-West Nigeria, targeted interventions are essential. Initiatives should include organizing training workshops on online survey and statistical analysis tools, fostering participation in professional development programs for academic social networking, and providing comprehensive

training on reference/citation management software. Encouraging continuous learning, peer collaboration, and implementing evaluation mechanisms will further enhance skill development. These efforts aim to empower librarians to proficiently support research endeavors, fostering a culture of ICT proficiency and research excellence within the academic community of South-West, Nigeria.

- 2. To enhance the research productivity of academic librarians in South-West Nigeria, it is crucial to invest in targeted ICT training programmes tailored to their needs. This should encompass both basic and advanced ICT skills relevant to research, with a focus on integrating ICT tools into daily workflows. Continuous professional development opportunities and supportive organizational policies should be established to foster a culture of ICT proficiency. Collaborative research initiatives and systematic monitoring mechanisms will further ensure the effective utilization of ICT for research purposes. By implementing these measures, academic library management can empower librarians to leverage ICT effectively, ultimately driving forward scholarly pursuits in the region.
- 3. Academic libraries in South-West, Nigeria should focus their efforts on enhancing reference citation management skills and academic social networking skills among their librarians to improve research productivity. These two dimensions were found to be significant predictors of research productivity, while basic operational skills, navigation skills, safety security skill, and online survey statistics skill were deemed insignificant. By prioritizing training and development initiatives in reference citation management and academic social networking, libraries can effectively address the challenges surrounding research productivity faced by academic librarians in the region.

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