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THE INFLUENCE OF ICT COMPETENCIES OF STAFF ON  
INSTITUTIONAL REPOSITORY OPERATIONS IN UNIVERSITY  
LIBRARIES IN NORTH-EAST, NIGERIA

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DOI: <https://doi.org/10.70382/caijlser.v8i8.023>

**Abstract**

The study examined the influence of ICT competencies of staff on institutional repository operations in university libraries in North-east, Nigeria. It introduced the concept of institutional repository, its operations in university libraries, north-east, Nigeria and it also highlighted the influence of ICT competencies of library staff. The study used cross-sectional survey research design. The population of the study comprises all librarians in North-east Universities. Questionnaire was used as research instrument. A total of one hundred and eighty (181) copies of questionnaires were administered, and one hundred and seventy three (173) were returned and found useful for analysis. The data collected was analysed using descriptive statistics. The findings revealed that the operational practices of IRs in university libraries in North-east Nigeria were found to be weak and low. Level of ICT skills of library staff in university libraries in North-East, Nigeria is also very low and the influence of ICT competency skills of library staff is high on institutional repository operations. The study recommends that the University management should improve the operational practices of IR in university libraries in north-east, Nigeria from analog to digital. The University management should organise workshop or in-service training that will improve librarians ICT competency skills. Since the influence of librarians ICT competency skills is high on institutional repository operations, the management should pave way for the librarians to go and improve their ICT competency skills.

**Keywords:** ICT, ICT Competencies, Institutional Repository

**Background to the Study**

Developments in information and communication technology have resulted in the emergence of institutional repositories, which are digital archives for the preservation and dissemination of institutional research outputs. Institutional repositories enable the wider dissemination of research outputs through the Internet. Institutional repositories are digital platforms used by educational institutions, research organisations, and other institutions to store, preserve, and provide access to their digital content, including research papers, theses, datasets, and other scholarly materials.

Every university wants to increase its visibility internationally. This is so because one method used to assess universities academically is visibility. Visibility gives people throughout the world the chance to judge the caliber of education, academic development, and research initiatives in a university. As a result of these university activities, they culminate in intellectual outcomes such as academic papers and various documents produced by the institution. These publications and

documents consist of peer-reviewed articles, theses, dissertations, inaugural lectures, seminars, conference proceedings, technical reports, lecture notes, and course materials, among various others. They contribute significantly to the advancement of knowledge. However, these publications need to be gathered and organized in a way that will improve their accessibility all over the world if they are to be useful to institutions beyond the point of publication or production. According to Olubiyo and Olubiyo (2023) Universities, as centers of higher education, prioritise research alongside their primary roles of teaching and community service. They further stated that the primary benchmark for evaluating a university's quality is the caliber and volume of its research output. Research, being essential for advancing knowledge and benefiting society, deserves significant focus, with careful consideration of the institutions producing these contributions. It becomes almost impossible to evaluate the university output in a situation where the research output from a specific institution or university cannot be accessed globally; this could also hinder the dissemination of research that can positively impact various regions globally.

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

The active management and sustainability of institutional repositories (IRs) in university libraries heavily depend on the competencies of library staff who are the custodian of the repositories. As digital scholarship and open access initiatives grow, institutional repositories have become critical for preserving and disseminating institutional research output. However, the successful implementation, maintenance, and operational practices of these repositories are often hindered by unpredictable levels of Information and Communication Technology (ICT) competencies among library staff. Inadequate skills in digital content management, metadata standards, software use, and data curation can significantly impair repository operations, limiting accessibility, discoverability, and overall impact. This study seeks to examine the extent to which ICT competencies among university library staff influence the effectiveness of institutional repository operations. It is in relation to the aforementioned gaps, this study examined the ICT competencies of staff as determinants of institutional repositories operations in university libraries in North-east Nigeria.

#### **Objectives of the Study**

The objectives of this research are to:

1. find out the operational practices of Institutional repository in university libraries in North-east, Nigeria
2. investigate the level of ICT competencies of library staff in university libraries in North-east, Nigeria
3. determine the influence of ICT competencies of library staff on institutional repository operations in university libraries in North-east, Nigeria.

#### **Significance of the Study**

The findings of this study assessed the ICT competencies of library staff, providing a practical understanding of the competencies, technological expertise, and modern that enables librarians to effectively use information technology for delivering dynamic information services. The findings of this study are anticipated to benefit practicing librarians in North-east Nigeria, as well as those in training, by introducing them to the use of open access institutional repositories.

## Literature Review

### The concept of institutional repository

Repositories are frequently associated with the open access movement, which provides unrestricted access to digital content without limitations. Typically, they house an institution's scholarly resources and are considered crucial for scholarly communication, university rankings, and institutional visibility (Elaturoti & Jatto, 2021). Institutional repositories are primarily used for acquiring, preserving, and disseminating locally-generated scholarly information.

A university's institutional repository encompasses services provided to its community members for managing and sharing digital information resources generated by the institution and its community. It represents the university's dedication to preserving these digital materials, including long-term preservation when necessary, as well as organizing and facilitating access or distribution. Institutional repositories are created to handle, preserve, and archive the digital assets, intellectual outputs, and historical records of institutions. They serve as digital collections housing the outputs produced within universities or research institutions (Chukwueke, *et al.*, 2020).

### ICT competencies of library staff

The current global technological landscape and digital transformation have redefined the roles of information professionals and librarians. Today, library professionals can acquire, store, and disseminate vast amounts of information using advanced ICT devices. Abbas and Siddique (2020) examined the evolving role of library professionals, emphasizing the need for new expertise due to the changing ICT environment. In this technological era, library and information professionals urgently require advanced skills. In response, Hamad *et al.* (2021) outlined the necessary competencies for librarians in the digital age and identified essential training methods for modern technological trends in libraries. They also recommended updating curricula, restructuring degree programs, and enhancing digital literacy skills at universities in the UK and Slovenia. Ashiq and Warraich (2022) also emphasized the importance of these skills for library and information science professionals, underscoring the necessity for library professionals to acquire ICT skills. Rafiq *et al.* (2021) noted that LIS professionals in Pakistan must adapt to 21st-century requirements to thrive in the digital era.

The Internet, being the largest repository of information and knowledge, has shifted the role of library and information science professionals from intermediaries to facilitators. It has introduced new tools for information dissemination, transitioned services from physical to virtual environments, and led to the extinction of some traditional information services while promoting the emergence of new, innovative web-based services. The pervasive influence of ICT in LIS is undeniable, as it is integral to library practice and training. Mamabolo (2022), emphasize the necessity for librarians to be well-versed in ICT competencies.

Khan and Shahzad (2022) found that many library professionals lacked skills in several ICT areas, including browsing search engines, computer programming, email management, institutional repositories, online directories, and security systems. Additionally, some LIS professionals were not proficient in handling e-resources and services, database management, online services, e-reference services, and web technologies.

### Research Methodology

Cross-sectional survey research design was chosen because it allows data collection at a single point in time, enabling the study of many subjects quickly and cost-effectively (Eigenschink, *et al.*, 2023). The population of the study was 181 professional librarians ranging from graduate assistants to principal librarians from twelve (12) university libraries under study. The research population is small therefore; total enumeration census sampling technique was used for this study, where all 181 professional librarians were used as respondents. Questionnaire was employed for data collection in the study. The data collection instrument (questionnaire) underwent a validation process. Cronbach Alpha was used to test the reliability of the instrument and the results revealed that all items designed in the questionnaire had 0.902 reliability indexes. The data collected in this study were analyzed using descriptive (mean and standard deviation) and the weighted mean served as the benchmark for accepting the sets of questions posed.

### Results and Discussion

A total of 181 questionnaires were distributed, but only 173 were returned, representing a response rate of 95.6%.

**Table 4.1 Operational practice of institutional repository in university libraries in North-East, Nigeria**

S/N	Design & Deployment	Frequency			Percentage (%)		
		Yes	No	Total	Yes	No	Total
1	The IR in my university is designed locally	158	15	173	91.3	8.7	100
2	The IR in my university is designed using open software (E.g., DSpace)	16	157	173	9.2	90.8	100
3	The IR in my university is still under development	154	19	173	89.0	11.0	100
4	The IR in my university is hosted locally	159	14	173	91.9	8.1	100
5	The IR in my university is hosted online	15	158	173	8.7	91.3	100
6	The IR in my university has been hosted online before, but it currently has some challenges	22	151	173	12.7	87.3	100
<b>Content and Collection Development</b>							
7	Contents have still been scanned and organised	138	35	173	79.8	20.2	100
8	Contents have been uploaded unto the repository	138	35	173	79.8	20.2	100
9	The contents on the repository are visible on the Internet	36	137	173	20.8	79.2	100
10	The policy for content collection is being developed	137	36	173	79.2	20.8	100
11	The policy for content collection has been developed	30	143	173	17.3	82.7	100
<b>Usage and Access</b>							
12	Usage of the contents is not currently open to everyone	144	29	173	83.2	16.8	100
13	Usage of the contents is open to librarians only	141	32	173	81.5	18.5	100
14	Access to contents is restricted to the university campus only	139	34	173	80.3	19.7	100

Table 4.1 presents frequencies and percentages of respondents' ratings on the operational practices of Institutional Repository in university libraries in North-east, Nigeria under three sub-headings; design and deployment, contents and collection development and usage and access. Table 4.6 shows that operation of institutional repository (IR) in university libraries in north-east is low because the IR of the university libraries in the zone was designed locally as respondents with responses rate of 158 (91.3%) stated. It also revealed that IR using open software (E.g., DSpace) was low in university libraries under study as respondents with No options were 157 (90.8%); the IR in my university is still under development with Yes response of 154 (89.0%); the IR in my university is hosted locally

with Yes response of 159 (91.9%); the IR in my university is hosted online with No response of 158 (91.3%); and the IR in my university has been hosted online before, but is currently have some challenges with No response of 151 equivalent 87.3%. From the foregoing, it can be inferred that IR design and deployment in the university libraries in the north-east zone is not in existence.

Also, in terms of content and collection development; respondents agreed that contents are still been scanned and organised with Yes response of 138 (79.8%); contents are uploaded unto the repository 138 (79.8%), but the contents on the repository are not visible on the Internet 137 (79.2); the policy for content collection is being developed with Yes response of 137 (79.2%); while the policy for content collection has been developed had No response of 143 equivalent to 82.7%. In essence, content and collection development of IR in University libraries in north-east are still under development since it is yet to be made available online for users to have access to them worldwide. Furthermore, looking at operational practices of IRs in term of its usage and access; respondents agreed that the usage of the contents is not currently open to everyone with Yes response of 144 connoting 83.2%; usage of the contents is open to librarians only with Yes response of 142 (81.5%); and access to contents is restricted to the university campus only with Yes response of 139 equivalent to 80.3%. Hence, usage and access to IR University libraries in north-east is restricted locally within the university.

In conclusion, the analyses in the Table 4.2 on the operational practices of IRs in university libraries in North-east Nigeria was found to be weak and low because IR is still under construction. Presently, the contents which are available are used locally within the university libraries under study.

### Research Question Two

**Table 4.2 Level of ICT competencies skills of library staff in university libraries in North-East, Nigeria**

HS-Highly Skilled, MS-Moderately Skilled, LS-Low Skilled

S/N	Statements	HS (3)	MS (2)	LS (1)	N	FX	Mean	SD	Remarks
<b>Basic Skills</b>									
1.	Word Processing (Microsoft word)	147	22	4	173	489	2.83	0.44	Skilled
2.	Statistical Analysis	6	88	79	173	273	1.58	0.56	Not Skilled
3.	Scanning and uploading	156	13	4	173	498	2.88	0.39	Skilled
4.	Electronic Presentation (PowerPoint)	20	114	39	173	327	1.89	0.58	Not Skilled
5.	Copying data from primary and secondary storage devices	99	66	8	173	437	2.53	0.59	Skilled
6.	Retrieving documents from storage devices	129	38	6	173	469	2.71	0.53	Skilled
<b>Weighted Mean</b>							2.40		
<b>Intermediate Skills</b>									
7.	Content Management (Blog creation and Maintenance)	1	32	140	173	207	1.20	0.41	Not Skilled
8.	Registration on online platforms	103	52	18	173	431	2.49	0.68	Skilled
9.	Document/Database management	4	140	29	173	321	1.86	0.41	Not Skilled
10.	Internet Surfing	144	22	7	173	483	2.79	0.5	Skilled

S/N	Statements	HS (3)	MS (2)	LS (1)	N 173	FX	Mean	SD	Remarks
11.	Information Search Strategy	9	134	30	173	325	1.88	0.46	Not Skilled
12.	Online Cataloguing	16	48	109	173	253	1.46	0.66	Not Skilled
13.	Use of Library software	0	141	32	173	314	1.82	0.39	Not Skilled
14.	Electronic Document Delivery	28	116	29	173	345	1.99	0.58	Skilled
<b>Weighted Mean</b>							<b>1.94</b>		
<b>Advanced Skills</b>									
15.	Programming (Java, HTML)	2	12	159	173	189	1.09	0.33	Not Skilled
16.	Library Automation	9	27	137	173	218	1.26	0.55	Skilled
17.	Networking	8	25	140	173	214	1.24	0.52	Skilled
18.	Knowledge Taxonomy	8	24	141	173	213	1.23	0.52	Skilled
19.	Software Installation	9	27	137	173	218	1.26	0.55	Skilled
<b>Weighted Mean</b>							<b>1.22</b>		

Source: Field Survey (2024)

The data presented in Table 4.2 were analysed to find out the level of ICT skills of library staff in university libraries in North-East, Nigeria. The criterion for each statement was skilled, if the weighted mean is less than the individual mean and not skilled if the weighted mean is more than the individual mean. The results revealed Means and Standard Deviations ratings on the level of ICT skills of library staff in university libraries in north-east, Nigeria. In order to address and answer research question two stated above, nineteen item statements related to the ICT skills of library staff were framed and used to seek answer for the question and they were grouped into three sub knowledge domains; basic ICT skills; intermediate ICT skills and advanced ICT skills.

From the results in Table 4.7, library staff of university libraries in north-east Nigeria possesses skills in Word Processing (Microsoft word) with computed mean value, 2.83; Scanning and uploading with estimated mean value 2.88; copying data from primary and secondary storage devices with mean value, 2.53; and retrieving documents from storage devices with mean value 2.71. However, the library staff did not possess basic ICT skills in Statistical Analysis with mean value, 1.58; and electronic presentation (PowerPoint) with mean value, 1.89. From the foregoing analyses, it can be concluded that library staff possess basic ICT skills because the total weighted Mean value for these skills was estimated to be 2.40.

The result on intermediate ICT skills of library staff in university libraries in north-east Nigeria revealed that the library staff in the study area were skilled in registration on online platforms with mean value, 2.49; Internet Surfing with mean value, 2.79; and Electronic Document Delivery with mean value, 2.00; whereas, they were not skilled in Content Management (Blog creation and Maintenance) with mean value, 1.20; Document/Database management with mean value, 1.86; Information Search Strategy with mean value 1.86; Online Cataloguing with mean value 1.46; and Use of Library Software with mean value, 1.82. Therefore, it can be inferred from total weighted Mean score, 1.94 for intermediate ICT skills that the library staff possessed little knowledge on the aforementioned skills.

The results on advanced ICT skill revealed that the library staff were skilled in five items listed on the advanced ICT skill. These items had a weighted Mean score higher or equal to 1.22. These

statements are statement 16: Library Automation with mean value, 1.26, statement 17: Networking with mean value, 1.24, statement 18: Knowledge Taxonomy with mean value, 1.23 and statement 19: Software Installation with mean value, 1.26 and not skilled in statement 15: Programming (Java, HTML) with mean value, 1.09 which is less than the weighed mean.

**Table 4.3 Influence of ICT competencies skills of library staff on the institutional repositories operation in university libraries in the North-East, Nigeria?**

S/N	Statement	SA	A	D	SD	N	FX	$\bar{x}$	SD	Dec.
		4	3	2	1	173				
	Knowledge of word processing plays a significant role in effective managing of content within institutional repository	63	77	27	6	173	543	3.14	.80214	Disagreed
2	Library staff with higher skills in scanning and uploading provide better user support for accessing repository materials	134	18	18	3	173	629	3.64	.73949	Agreed
	Library staff with advanced skills of retrieving documents from storage devices troubleshoot technical issues related to the institutional repository operation	77	93	1	2	173	591	3.42	.57077	Agreed
4	The ability of library staff to effectively use library software to manage repositories	26	68	69	10	173	456	2.64	.80715	Disagreed
5	Limited skills in electronic document delivery hindered the successful operation of the institutional repository.	127	25		11	173	614	3.55	.78973	Agreed
6	Library staff with high skills in internet surfing contribute positively to the repository's visibility and usage among users	41	108	20	4	173	532	3.08	.66483	Disagreed
	Enhanced information searching strategies among library staff leads to more efficient and streamlined repository management	64	90	9	10	173	554	3.20	.78473	Disagreed
	<b>Weighted Mean</b>							<b>3.24</b>		

Table 4.3 revealed the frequency counts and percentage, mean and standard deviation on the influence of ICT competencies of library staff on the institutional repositories' operation in university libraries in the North-East, Nigeria. The table shows that items 2,3 and 5 means were above the Weighted Mean while item 1,4,6 and 7 were below the weighted mean which implies that ICT competencies skills of library staff has less influence on institutional repository operations in University libraries in the North East, Nigeria.

### **Discussion of the Findings**

#### **Research question 1: What are the operational practices of IRs in university libraries in North-east, Nigeria?**

Research question one sought to determine the operational practices of IRs in university libraries in North-east Nigeria. The study discovered that, operational practices of IRs in university libraries in North-east Nigeria were not at optimal level. This result disagrees with Mahanta, (2021) result, conducted a research on A Study on the Implementation of Institutional Repositories in the College Libraries of Assam. The study attempts to identify institutional repositories operations in the college libraries of Assam. The results of the study have showed that fifty-four colleges out of one hundred twenty-six surveyed college libraries have developed functional institutional repositories while twenty-three college libraries have started the process and forty-nine colleges don't have institutional repositories.

#### **Research question 2: what is the level of ICT skills of library staff in university libraries in North-East, Nigeria?**

Research question two sought to determine the level of ICT skills of library staff in university libraries in North-East, Nigeria. This study discovered that, the library staff are skilled in basic ICT skills and they are not skilled in both intermediate skills and advanced skills. This result agrees with Ahmed & Sheikh, (2021) result, they conducted a study on ICT skills among librarians in engineering educational institution. Finding of their study reveals that the librarians of those institutions have basic ICT skills but lack adequate knowledge on network based services and digital services. On the other hand, Ubogu, (2022) examined the Influence of ICT competencies on job performance in Nigerian university libraries. Finding reveals that Librarians in public universities libraries in Nigeria lack the requisite ICT skills that can enable them provide efficient library service that is driven by information technology.

#### **Influence of the ICT competencies skills of library staff on institutional repository operations in university libraries**

The results depicted in Table 4.3 revealed the means and standard deviations of respondents' ratings on the influence of the ICT competencies of library staff on institutional repository operations in university libraries in the north-east of Nigeria. From the results in Table 4.3, all item statements were unanimously agreed by the respondents, indicating that the ICT competencies of library staff has high influence on institutional repository operations. These were evident by the computed mean value of each of the items, which were greater than the weighted mean in the study. Therefore, it can be inferred here that the ICT competencies of library staff have a high influence on institutional repository operations in university libraries in north-east of Nigeria. The findings of this study align with those of Sani and Musa (2019), which revealed that the level of ICT competence among library staff significantly enhanced their job efficacy and performance, enabling them to meet job demands effectively. This study also concurs with Solomon and Soyemi (2021), findings which reported that library personnel were highly competence in basic and intermediate ICT skills and moderate competence in advanced skills.

### **Recommendations**

The study recommended the following:

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1. The University management should improve the operational practices of IR in university libraries north-east Nigeria from analog to digital.
2. The University management should organize workshop or in-service training that will the librarians to improve their ICT competencies,
3. Since the influence of librarians ICT competency skills is high on institutional repository operations, the management should pave way for the librarians to go and improve their ICT competency skill.

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