LAFIA JOURNAL OF LIBRARY AND INFORMATION SCIENCE
LJLIS Volume 1, Number 1, 2022
https://lalibjournals.org/index.php/LJLIS
ISSN: Print - 2814-0702, Online - 2814-0710
(LJLIS)

APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES ON PRESERVATION AND CONSERVATION OF RESOURCES IN UNIVERSITY LIBRARIES IN NORTH CENTRAL NIGERIA

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Abstract
This study investigated the application of information and communication technologies on preservation and conservation resources in university libraries in North Central Nigeria. Descriptive research design was used. There was no sampling technique because the entire population is 181 respondents which include 166 academic librarians and 15 computer experts in the libraries were accessible and manageable by the researchers. Questionnaire and checklist were used for collection of data. Percentage, mean and standard deviation were used to analyze the data. It was discovered that 6 ICT facilities were to a very high extent available, 3 facilities were to a high extent, while 8 facilities were to a low extent available respectively. The findings showed that the application of ICTs influenced the skills and competencies of library staff to a great extent, digitization, recording, information refreshing and technology preservation were the only ICT preservation techniques that were applied to a great extent. Funding, power supply, cost of ICT facilities, Internet connectivity were some of the challenges identified, while adequate training on ICT, empowering librarians, making proactive preservation policy were appropriate strategies. Based on this, the researchers recommended that University authorities and TETFund should provide all relevant ICT facilities for preservation and conservation of information resources. University libraries in North Central Nigeria should organize more relevant workshops, seminars and other training sessions. Academic librarians should explore more techniques through inter-library cooperation, especially with any zone where all digital preservation techniques are available. Finally, the appropriate strategies should be adopted as a working policy on preservation and conservation of information resources in all university libraries.
Keywords: Preservation, Conservation, ICTs, Library Resources

Introduction

Universities are educational institutions for higher learning mandated to undertake studies in various disciplines. A university library is a library system established, administered and funded by the university to meet the information, research and curriculum needs of its students, faculty and staff (Dictionary of Library & Info Science, 2005). Based on the aforementioned, it is the duty of university libraries to select, provide, catalogue and circulate all the information materials in their collections and also provide users' education to it numerous users. These duties made every librarian crave for the safety of his collections. As a result, whenever a book or non-book material is damaged beyond repair, mutilated beyond usefulness or stolen from the library, it has to be replaced and protected. The needs, cost and stress

of replacement are seemed to be unbearable to many university libraries. As a result, university librarians seek for ways to protect their collections through preservation and conservation.

In Nigeria, diminishing rate of scholarly information materials in university libraries is becoming alarming (Onyedu, Sanni & Udoakang, 2014). In university libraries in north central Nigeria, Akor (2014) observed that the rate of mutilation, deterioration and theft of library resources is rampant. This has made research, teaching and learning very difficult. Service delivery is hampered as many users became frustrated and disgusted when they couldn't locate or retrieve their needed materials or found them in a bad condition. Rare manuscripts, ephemerals and other historical documents were allowed to decay or wasted due to inadequate and improper preservation and conservation mechanism which is manual in nature. Even, ICTs like CDs, DVDs, films; computer hard and software were worst hit. Some audio-visual materials like radio, TVs, slides, etc are not functioning well. Again, a large volume of newspapers, journals and other serial materials were destroyed due to lack of better preservation.

It is a worrisome situation. The remedies rely on adopting the best method in preserving these valuable materials. The best method according to Abdulsalami and Salami (2013) is the application of information and communication technologies (ICTs) to enhance their longevity. These university libraries in north central, as a matter of policy are expected to have applied ICTs on preservation and conservation of resources in their libraries. Consequently, the extent these ICTs were applied in University Libraries in North Central Nigeria has become an issue for investigation, hence this study.

Statement of the Problem

As a result of constant usage coupled with the growing population of users, information materials got damaged, mutilated and frequently pilfered. Faced with reduced funding from parent organizations, librarians solicitously crave for maximization and protection of what their libraries already have. This situation has generally affected the quality of information accessed and service rendered by the libraries. In spite of the availability and application of ICTs to preserve and conserve library resources, there seems to be more deteriorations and mutilations; library materials fretting away from libraries on daily basis. This has created a gap in the services and uses of university libraries in general, coupled with other existing gaps created by inadequate manual preservation system.

Based on the foregoing, there is need for an empirical study to examine the application of ICTs on preservation and conservation of library resources in university libraries north central Nigeria. There appears to be none now and this provokes the researcher to find out the extent of application of ICTs and its influence on the preservation and conservation of library resources in university libraries in North Central, Nigeria.

Objectives of the Study

The general purpose of this study is to determine the extent of application of ICTs on preservation and conservation of resources in university libraries in north central Nigeria. Specifically, the study seeks to:

1. determine the extent of ICTs application on preservation and conservation especially in university libraries in north central Nigeria.
2. find the extent ICTs influence library staff skills and competencies in preservation and conservation of library resources in north central Nigeria.

3. ascertain that ICT preservation techniques are applied for preservation and conservation in university libraries in north central Nigeria.
4. identify challenges in application of ICTs for preservation and conservation of library resources in university libraries north central Nigeria.
5. determine the appropriate strategies to improve ICTs for preservation and conservation of library resources in university libraries north central Nigeria.

Review of Related Literature

University libraries are established to support academic work of the university. Akussah and Bentill (2010) stated that university libraries are created to assist in advancement of learning, research and dissemination of knowledge, serving the information needs of universities and their communities. This means that university libraries are the "heart" of the university. Akor (2014) stated that university library is a complex institution must have large quantities of materials to meet the demands of the users. These large quantities of materials need to be protected from damages and deterioration. That's why Olatokun (2008) stated that libraries in Nigeria faced a lot of problems and these problems affect book and non-book. Tsegba (2017) explained that non-books include all electronic information resources like CD-ROMs, internet, flash drives, audio/visual players, database et al. Atuh (2011) predicated that all paper-based records of 20th century as well as those earlier years face imminent ruin except new and effective effort for preservation were introduced. One of the effective efforts is the application of ICTs on preservation and conservation for future retrieval and determination.

Information and Communication Technology (ICT) encompasses modern technologies such as computers, telecommunications, facsimile and microelectronics etc used to manipulate and store information and knowledge. According to Abdulsalam and Salam (2013) ICT is the technology that supports activities involving the creation, storage, manipulation and communication of information, together with the related methods, management and application. The researchers agreed that the word "storage" and "application" made ICT a recommendable facility for preservation and conservation of information in the libraries.

There are two concepts in ICT preservation: digitization and digital preservation. The former, according to Akporhonor (2010) is a process of converting traditional library materials such as books, and other paper-based information materials into electronic format so that they can be stored and manipulated. The latter, Conway (2006) explained that it involves copying the digital information into newer media before the media becomes obsolete. According to Lee (2002) digital preservation include technology preservation, preservation emulation, information migration and encapsulation. The researcher agreed that these systems can enhance information preservation and conservation in any university library.

Conservation helps to maintain a record and allow a reasonable amount of usage. Olatokun (2008) said that conservation is the most central activity of preservation. But Obiku (2002) had already defined conservation as an act of preservation, protecting and selecting materials from destructive influences that shorten their life span. On the other hand, "preservation" and "conservation" are often used interchangeably to mean the process of keeping an object from harm or loss, damage, destruction or decay, and maintaining it in a reasonably sound condition for present and future use. Therefore, conservation is an activity of which preservation is one aspect. However, preservation deals with the maintenance while conservation deals with the remedial treatment and restoration of the already damaged materials (Anjaiah, 2008).

Notwithstanding, using ICT facilities to preserve and conserve has many challenges. These include inadequate power supply, lack of preservation policy, lack of ICT training, lack of necessary preservation skills to search and evaluate which particular information resources has to be preserved (Aderibigbe, 2010).

Methodology

Descriptive survey research design was use in this study. The area of is north central geo-political zone of Nigeria. The population of this study is one hundred and eighty-one (181) persons which include one hundred and sixty-six (166) academic librarians and fifteen (15) ICT experts. The above stated population is accessible and manageable, the researchers all the population, and no sample size and sampling technique used. Data were collected through questionnaire and observation checklist. The researcher made use of research assistants who are staff of the library studied. Three experts carried out face validity of the questionnaire. The questionnaire was also subjected to reliability test and showed an overall correlation of 0.96 which indicated that it is reliable. Out of 181 questionnaire distributed in 10 university libraries north central Nigeria, 147 copies representing 81.21% were returned and used while 34 copies representing 18.79% were not returned. Data collected were analyzed using descriptive and inferential statistics; percentages, weighted mean scores and standard deviation were used to answer the research questions.

Data Analysis

Research Question 1: What are extent of ICTs application on preservation and conservation of resources in university libraries in north central Nigeria?

Table 1: Descriptive Statistics of responses on the extent of ICT application on Preservation and Conservation of Resources in University Libraries in North Central Nigeria

		Status				**Overall**	**D**	
		Academic Libraries N=132		**FCT Experts N = 15**				
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	
S/N	**Computer Technology**							
1	Databases	33.3	.70	3.20	.94	3.29	.72	GE
2	Library software	3.19	.86	3.64	.50	3.15	.85	GE
3	Computer hard disk drive	3.13	.71	3.38	.65	3.10	.72	GE
4	Flash drives	3.11	.76	3.20	.68	3.07	.75	GE
5	CD-ROMs	2.99	.82	3.13	.83	3.0	.83	GE
6	Floppy discs	2.73	.94	2.79	.70	2.69	.93	GE
7	Optical discs	2.59	.81	3.09	.94	2.73	.83	GE
8	Computers	3.51	.66	3.36	.67	3.25	.66	GE
	Telecommunication Facilities					**2.68**	**.50**	**GE**
9	Tapes/video recorders	2.60	.97	3.00	.58	2.69	.95	GE
10	Magnetic tapes	2.07	.82	2.73	.88	2.66	.85	GE
11	Internet (e-library)	3.43	.79	3.27	.80	3.30	.80	GE
12	Video discs	2.51	.87	2.50	.94	2.48	.88	GE
13	Cameras (digital)	2.22	.96	2.62	.1.04	2.30	.97	LE
	Electronic Facilities					**2.02**	**.41**	**LE**
14	Closed circuit television	2.12	.104	2.40	.91	2.17	.40	LE
15	Microprinting facilities	1.98	.89	2.33	1.11	2.03	.92	LE
16	Bar pen	1.90	.87	2.07	.92	1.95	.88	LE
17	Optical Character Recognition (OCR)	1.87	.90	2.13	.92	1.94	.92	LE
	Grand Total					**2.58**	**.57**	**GE**

Using the principle of real limit of numbers, the result of the data analysis in Table 2 above shows that computer technologies (mean=3.03) and telecommunication facilities (mean=2.68) are applied to a great extent, while electronic facilities (mean=2.02) was applied to a low extent. Moreover, according to observation checklist, magnetic ink character recognition (MICR), mylar and cellulose acetate were not available in any university library in north central Nigeria.

Research Question 2: What extents do ICTs influence library staff skills and competencies on preservation and conservation of resources in university libraries north central Nigeria?

Research question 2 sought to know the extent application of ICTs influence library staff skills and competencies for preservation and conservation of resources in the stated libraries. The analysis of data is presented in the Table 2 below.

Table 2: Descriptive statistics of responses on the extent application of ICT influence library staff skills and competencies for preservation and conservation of resources

		Status				**Overall**		**R**	
		Academic Libraries N=132		**FCT Experts N = 15**					
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**		
S/N	**Skill and Competencies**								
1	Scanning, uploading, downloading and converting print and non-print materials to preserve them online	3.38	.73	3.40	.83	3.38	.74	1st	VA
2	Using CD-ROMs, DVDs, flash drives computer databases, OPAC, etc to preserve it in digital format now in my library	3.15	.78	3.36	.84	3.15	.79	2nd	VA
3	Ability to crawl, scan, manipulate download and upload any data to preserve information in digital format now in library	3.13	.80	3.14	.86	3.13	.80	3rd	VA
4	Converting print materials (through the digitization) into computer for future use	2.99	.90	3.00	.78	2.99	.89	4th	VA
5	Improving the skills for the staff in digital preservation and conservation	2.96	.91	3.14	.86	2.96	.91	5th	A
6	Using remote databases in creation storing and retrieval of digital information in due time	2.87	.79	3.08	.95	2.87	.81	6th	A
7	Mastering the skills needed to fix, install and use many of these facilities for preservation and conservation in my library	2.72	.80	2.86	.53	2.72	.78	7th	A
8	Using microfilming and microprinting facilities to condensed bulky serial materials in order to preserve them	2.49	.86	2.71	.83	2.49	.86	8th	A
9	Creating and using magnetic and optic storage system for preservation and conservation of digital information of the library	2.48	.82	2.54	.66	2.48	.81	9th	A
10	Handling the electronic security system like CCTVs, biometric devices to forestall theft, mutilation	2.25	.92	2.71	.107	2.25	.91	10th	A
	Grand Total	**2.84**	**.73**	**2.99**	**.62**	**2.81**	**.35**		**GE**

Using the principle of real limit of numbers, the result analysis in Table 3 above revealed that out of 10 skills and competencies in the table, items 1-7 recorded great extent, while items 8-10 recorded low extent. The overall mean showed that scanning, uploading, downloading and converting printing and non-print materials to preserve them online in my library (mean=3.32) is ranked highest while handling the electronic security system like CCTVs, biometrics methods to prevent theft, mutilation etc in my library etc (mean=2.29) is ranked lowest.

Research Question 3: What is the extent of application of ICTs preservation techniques on preservation and conservation of resources in university libraries north central Nigeria?

Research question 3 sought to know the extent application of ICTs preservation techniques on preservation and conservation of resources in the stated libraries. The analysis of data is presented in the table 3 below:

Table 3: Descriptive statistics of responses on the extent of application of ICT preservation techniques on preservation and conservation of library resources in university libraries

		Status				**Overall**		**R**	**D**
		Academic Libraries N=132		**FCT Experts N = 15**					
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**		
S/N	**ICT Preservation Techniques**								
1	Digitization	3.56	.76	3.40	.91	3.08	.83	1st	GE
2	Recording	2.68	.92	2.80	1.15	2.70	.83	2nd	GE
3	Technology preservation	3.19	.84	2.10	1.07	2.67	.88	3rd	GE
4	Information refreshing	2.89	.97	2.00	1.13	2.52	.97	4th	GE
5	Information migration	2.83	.86	2.40	.91	2.44	.92	5th	LE
6	Information replication	2.53	.70	2.29	.91	2.46	.89	6th	LE
7	Preservation emulation	2.28	.82	2.60	.85	2.39	.91	7th	LE
8	Microfilming/microprinting	2.26	.86	2.62	1.12	2.45	.85	8th	LE
9	Encapsulation	2.13	.84	2.93	1.03	2.28	.89	9th	LE
	Grand total	**2.70**	**.55**	**2.57**	**.42**	**2.53**	**.20**		**GE**

Note: GE: Great Extent, LE: Low Extent, R: Ranking, D: Decision

Using the principle of real limit of numbers, the results reveal that out of 9 above mentioned techniques, 4 techniques (1-4) were to great extent applied on preservation and conservation, while techniques 5-9 were applied to low extent. The overall mean showed that digitization (mean=3.08) is ranked highest, while encapsulation (mean=2.28) is ranked lowest.

Research Question 4: What are the challenge of ICTs for preservation and conservation of library resources in university libraries north central Nigeria?

Research question 4 sought to identify challenges facing the uses of ICTs for preservation and conservation of resources in the stated libraries. The analysis of data is presented in the table 4 below:

Table 4: Descriptive statistics of responses on challenges facing the uses of ICTs preservation and conservation of resources in university libraries in North Central Nigeria

		Status				**Overall**			
		Academic Libraries N=132		**FCT Experts N = 15**					
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**		
S/N	**Challenges**								
1	Funding	3.56	.76	3.40	.91	3.51	.78	1st	A
2	Supply of electricity and running of generators	2.68	.92	2.80	1.15	3.46	.73	2nd	A
3	Cost of ICTs especially installation, application and maintenance	3.19	.84	3.00	1.07	3.41	.86	3rd	A
4	Internet connectivity and use of AVMs, etc	2.89	.97	3.00	1.13	3.30	.86	4th	A
5	Preservation and conservation policy or disaster control plan	3.33	.86	3.40	.91	3.22	.86	5th	A
6	Economic policies like high duties, tariffs, VATs, etc	3.53	.70	3.29	.91	.17	.85	6th	A
7	Environmental conditions	2.98	.82	3.00	.85	3.07	.88	7th	A
8	Complexity and dynamic nature of digital content	3.06	.86	2.62	1.12	3.04	.80	8th	A
9	ICT librarians to handle the ICTs and manipulate information	3.13	.84	2.93	1.03	2.97	.99	9th	A
10	Attitude of library staff	3.23	.82	3.07	1.10	2.77	.93	10th	A
	Grand Total	**3.16**	**.76**	**3.05**	**.45**	**3.11**	**.54**		

Data in Table 4 above showed that the mean rating of the respondents on the challenges of ICTs on preservation and conservation has mean values ranging from 2.77 to 3.51. Using the criterion mean of 2.50, the table indicates that all 10 challenges mentioned were above cut-off point of 2.50 on 4 points rating scale; this shows that the respondents agreed that all these challenges are restraining the uses of ICTs for preservation and conservation in university libraries in North Central Nigeria.

Research Question 5: what are the appropriate strategies can be adopted to improve application of ICTs for preservation and conservation of resources in university libraries north central Nigeria?

Research question 5 sought to identify appropriate strategies can be adopted to improve application of ICTs for preservation and conservation of resources in university libraries north central Nigeria. The analysis of data is presented in the table 5 below:

Table 5: Descriptive statistics of responses on appropriate strategies to improve application of ICTs on preservation and conservation in university libraries in North Central Nigeria

		Status				**Overall**			
		Academic Libraries N=132		**FCT Experts N = 15**					
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**		
S/N	**Strategies**								
1	Training of librarians on ICT preservation programme	3.67	.61	3.64	.50	3.61	.58	1st	VA
2	Empowering librarians by exposing them to uses of digital preservation	3.00	.58	3.62	.51	3.59	.62	2nd	VA
3	Proactive policy to handle disaster	3.63	.63	3.77	.44	3.54	.59	3rd	VA
4	ICT international standards should be adopted and included in the curriculum and training of librarians	3.52	.64	3.54	.52	3.52	.61	4th	VA
5	Creation of ICT unit in the library especially where there is no e-library, virtual library etc	3.55	.63	3.62	.51	3.48	.58	5th	A
6	Create, intensify and sustain the awareness of uses of ICTs and importance of preservation	3.56	.59	3.62	.51	3.37	.58	6th	A
7	Networking and resource sharing among libraries in north central zone	3.57	.57	3.54	.66	3.33	.63	7th	A
8	Librarians to oversee the acquisition Installation and utilization of ICTs Especially software, internet, etc	3.50	.60	3.46	.52	3.32	.63	8th	A
9	Synergy with NGOs, multinational Companies to provide preservation Facilities like AVMs, computers, etc	3.52	.62	3.46	.66	3.28	.62	9th	A
10	Creating database and accessing of other libraries' databases	3.62	.59	3.69	.48	3.24	.60	10th	A
	Grand Total	**3.52**	**.79**	**3.55**	**.73**	**3.03**	**.45**		

Note: VA: Very Appropriate; A: Appropriate

Using the principle of real limit of numbers, the results of the data analysis reveal that out of 10 strategies mentioned above, from 1 to 4 were very appropriate strategies, while 5 to 10 strategies were just appropriate. The overall mean showed that training of librarians on ICTs and preservation programme (mean=3.61) ranked highest while creation and accessing of other libraries' databases (mean=3.24) ranked lowest.

Summary of Major Findings

1. The available ICT facilities are applied in preservation and conservation of information resources in the University Libraries in North Central Nigeria to a very extent.
2. Application of these ICT facilities has to a great extent influenced the skills and competencies of the library stall. They can now use these facilities effectively without recourse to the ICT experts attached to the library.
3. Out of the nine ICT preservation techniques mentioned, only four have been applied to a great extent. These techniques include digitization, recording, technology preservation and information refreshing. The remaining techniques were lowly applied.
4. There are many challenges to the uses of ICT facilities were discovered. They include lack of fund, poor power supply, and high cost of ICT facilities, low internet connectivity and bad attitude of library staff.
5. Some strategies were found to be appropriate to improve the uses of ICT for preservation and conservation of library resources in the university studied. They ranged from empowering librarians by exposing them to digital preservation practices to increase ICT awareness and creating ICT unit in the library and among other strategies.

Conclusions

The study concluded that the ICT facilities listed were applied to a great extent. It found out that the application of ICTs have to a great extent influence the skills and competencies of the library staff. Many challenges were identified. Strategies were recommended. These findings and recommendations will definitely improve the effective uses of ICT facilities for preservation and conservation of resources in the university libraries especially in North Central Nigeria.

Recommendations

The following recommendations were made based on findings of the study:

1. University authorities and TETFund should provide all relevant ICT facilities for preservation and conservation of information resources. Since it was revealed that the available facilities are apply to a great extent, providing more facilities will help the libraries to preserve and conserve more information resources for present and future use.
2. University libraries, especially in North Central Nigeria should organize more relevant workshops, seminars and other training sessions in order to expose academic librarians and other library staff to use the ICTs for preservation and conservation of library resources.
3. Few digital preservation techniques were applied in the university libraries studied; therefore, academic librarians should explore more techniques through inter-library cooperation, especially with any zone where all digital preservation techniques are available.
4. In order to solve the challenges identified, university libraries should be allowed to seek for funds from Non-Governmental Organizations (NGOs), Multi-National Companies (MNCs), industries etc. This is to enable them raise funds and expertise needed for digital preservation.
5. All the appropriate strategies identified in the study should be adopted as a working policy on preservation and conservation of information resources in all university libraries by Librarian Registration Council of Nigeria (LRCN) for further deliberations further deliberations.

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