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Sustaining e-resources in Nigerian University Libraries: results of a survey

(Źródła elektroniczne w bibliotekach uniwersyteckich Nigerii. Wyniki badań ankietowych)

Słowa kluczowe: media elektroniczne, e-czasopisma, biblioteki akademickie, Nigeria, technologie komunikacyjno-informacyjne
Abstrakt: W artykule przedstawiono problem zakupu czasopism elektronicznych, z którym mają do czynienia biblioteki akademickie w Nigerii. Opisane zostały rozwiązania kwestii kluczowe dla gromadzenia e-czasopism w bibliotekach. Artykuł wykazuje, iż większość bibliotek akademickich w Nigerii dysponuje technologiami informacyjno-komunikacyjnymi potrzebnymi do wykorzystywania e-czasopism oraz dostępem do Internetu, a jednocześnie zauważalny jest brak dostępu do e-czasopism poprzez OPAC. Budżet na zbiory drukowane jest zdecydowanie większy niż na e-czasopisma, a najważniejszym problemem, na którym koncentrują się biblioteki, jest finansowanie i konserwacja wyposażenia.

Keywords: electronic media, e-journals, academic libraries, Nigeria, ICT infrastructure
Abstract: The article presents e-journals as they are dealt with in Nigerian academic libraries. It describes the key issues connected with e-journal storing in libraries. The article proves that most academic libraries in Nigeria have Internet access and sufficient e-technologies in order to make use of e-journals, but they cannot be always accessed by means of OPAC. The budget for printed resources is much more substantial than that for e-journals, and the most important problems faced by libraries is that of funding and facilities maintenance.

A number of studies have addressed the reasons for acquiring e-resources in academic libraries. Grace Chu [5] surveyed 95 major academic libraries in the United States to examine how librarians were responding to e-journals. The author reported that the top five libraries cited reasons for acquiring e-journals as:

- ability to provide remote access;
- simultaneous use by more than one user;
- timely access;

- searching capabilities not found with print journals and
- accommodation of such unique features as links to related items.

From this study, it is obvious that libraries benefit from e-journals. The study revealed also that e-journals provide users faster, more convenient 24 hour desktop access from home or campus. Ohis State University (OSU) conducted a user survey of e-journals during the year 1998-2000 [9]. The survey showed that there were was significant progress in the acceptance and usage of electronic journals at OSU, however, some inhibiting factors that bothered on management issues were identified. Having read the literature on the topic, the authors wondered how such inhibiting factors affected the use of e-journals in Nigerian universities, hence the decision to undertake a research study intended to answer the questions. The purpose of this study is to examine:

- available infrastructure to support the use of e-journals;
- access to e-journals;
- university's policy on computer usage;
- advantages of e-journals and
- financial commitments to e-journals.

Access to e-journals in libraries is an important matter. The sustainability of the organization's IT infrastructure is important when the issue of access to journals is discussed. Michael Breaks [4] in his insightful book says the level of hardware provision within the organization must be properly considered. He adds that the number of computers, the age and the state of maintenance are crucial to access to e-journals. The point being made is clear, as older, low specification machines may not be able to provide access to some of the more recent version of e-journals. Supporting this position, Debbie Malone et al. [8] say it is important for librarians to provide sufficient hardware, software, network facilities, electronic resources and continuously innovative user services. The author gives some key factors that can influence the decision to provide computers in libraries, these include among others:

1. Users' ownership of computers, laptops, pads, internet enabled phones.
2. Presence or absence of wireless network.
3. Presence or absence of IT/library collaboration.
4. Availability of computers in other departments.

Matt Holland [6] notes that one time provision of hardware, software, network infrastructure is not sufficient. It requires continuous improvement and upgradation of systems to pace with the fast changing information technologies.

Jennifer Smith [10] reminds us that one major advantage held by libraries in the present age is providing patrons with the round-the-clock access to scholarly materials. Users are no longer dependent on the hours of their materials. It is by having adequate and up-to-date ICT infrastructural facilities that users can gain access to e-resources without any hinderance. This has been a major problem in Nigerian libraries [1; 2].

Hazel Woodward [12] notes that libraries have begun to add e-journals to their collections usually decide to catalogue them. Cataloguing is greatly facilitated if the OPAC is well-based, as hypertext links can be made directly from OPAC to the title pages of e-journals, or because of the way certain commercial publishers provide access to their titles, via the publishers' own e-journals web page. Frances Boyle [3] in his survey on the management of e-journals conducted on the electronic discussion lis-serials showed that where libraries hold both a print and electronic subscription to a journal, 75% of respondents create separate print and electronic catalogue records, using the MARC 856 field to add the Universal Resource Locator (URL) to link to OPAC and or their e-journal www page. A suitable means need to be sought to provide such link to OPAC.

Reader services activities are vital elements in the process of making serials, and information they contain available to library users. A carefully selected and maintained e-resource is not fulfilling its purpose if it is not exploited to maximum advantage. Users need to be aware of how they can find out e-resources that is included in the collection, and how to locate specific titles and information. Kristin Vogel [11] reiterates that the introduction of the OPAC has made the retrieval of information about the serials collection much easier and more effective and this, of course, is enhanced if full-text material is also available.

Donald Kennedy [7] several years back has noted that the current growth rate of scholarly publishing threatens the economic health of university budgets and makes it increasingly difficult for scholars to sort the worthwhile from the valueless. He also adds that libraries see the prices of scholarly journals rise by over 10 percent each year. At the same time, the fraction of university budgets devoted to libraries has been generally declining, electronic resources is seen by most librarians as a partial answer to the problem of their ability to acquire an increasingly limited share of the world's literature. Michael Breaks [4] over two decades ago observed that electronic information resources raise a new set of financial issues for the library's collection policy. The first requirement is to find the money to pay for new electronic resources. It is acclaimed that electronic information resources are more rather less expensive than print resources, a library's existing budgeting traditions will, of course, have a significant effect on the extent of the provision of new electronic information resources. The author provides a U.K. example of the budget on electronic resources as follows:

> U.K. academic libraries spend an average of title more than 10 percent on their material budget on electronic resources, the collection management raised by electronic resources consume far more than 10 percent of a library's staff resources.

The academic libraries at the time of writing the book were still essentially print-based. However, full text electronic journal services that were at their infancy some

years has gained reputation in most libraries presently. The literature review has addressed pertinent areas to the sustainability of e-resources in libraries as follows:

- need for suitable, adequate and necessary infrastructural facilities;
- access to e-resources via OPAC, which must be web-based to facilitate the hypertext links of e-journals;
- need for adequate financial provision for yearly renewal of subscriptions to e-resources;

A study to obtain information on issues pertinent to the sustainability of e-resources in Nigerian universities has been undertaken. The objectives of the study were:

- to determine the adequacy and current state of IT that will shape and sustain the exploitation of e-resources in Nigerian universities;
- to find out the financial commitments to both e-journals and print for two consecutive years, i.e. 2008 and 2009;
- to find out how libraries provide access to e-journals;
- to find out the policy of university libraries on use of computers for both staff and students;
- to identify the advantages and disadvantages arising from the use of e-journals in the university libraries;
- to determine other constraints to the availability and use of e-resources by soliciting comments from university libraries.

A descriptive survey was used to collect data for this study. The survey collects data on the profile of university libraries selected for the study, allocation of fund for electronic resources, ICT infrastructural facilities, policy on use of computers and the general management of e-journals in libraries.

The population for this study consists of 95 universities at the time the proposal for the study was presented for approval. The universities are grouped as follows:

Federal Universities – 27
State Universities – 34
Private Universities – 34

These universities are located across the six geo-political zones of Nigeria, namely: North West, North Central, North East, South West, South East, and South-South. However, only the universities that have existed for four years were adopted as target population for the study, and 76 (80%) fall into this category.

For logistics reasons, a purposive sample of 30 university libraries was taken from the target population. To select the sample, the multi-stage stratified sampling method was used. The first stage grouped the 76 universities that met the condition for inclusion in the study into their geo-political zones. Each geo-political zone was considered as a stratum. At the second stage, a sample frame of 39.5% (30/76 × 100%) was calculated for each stratum to select samples from the target population.

To arrive at the final sample size of 30 university libraries, balloting system was adopted.

Table 1. Rename and ownership of libraries selected from each stratum

S/N	UNIVERSITY	GEO-POLITICAL ZONE	OWNERSHIP
1	University of Ilorin	North Central	FU
2	University of Abuja	North Central	FU
3	Kogi State University, Ayingba	North Central	SU
4	American University of Nigeria, Yola	North East	PU
5	Jubilee University, Wukari	North East	PU
6	Bayero University, Kano	North West	FU
7	Usman Dan Fodiyo University, Sokoto	North West	FU
8	Michael Okpara University of Agriculture, Umudike	South East	SU
9	University of Nigeria, Nsukka	South East	FU
10	Nnamdi Azikwe University, Awka	South East	SU
11	Enugu State University of School & Technlogy, Enugu	South East	SU
12	Imo State University, Owerri	South East	SU
13	Caritas University, Enugu	South East	PU
14	Anambra State University, Uli	South East	SU
15	Federal University of Technology, Akure	South West	FU
16	University of Agriculture, Abeokuta	South West	FU
17	Adekunle Ajasin University, Akungba	South West	SU
18	Ladoke Akintola University of Technology, Ogbomosho	South West	SU
19	University of Ado-Ekiti, Ado-Ekiti	South West	SU
20	Crawford University, Igbesa	South West	PU
21	Joseph Babalola University, Ikeji-Arakeji	South West	PU
22	Lead City University, Ibadan	South West	PU
23	Redeemer's University, Mowe	South West	PU
24	Pan African University, Lagos	South West	PU
25	University of Calabar, Calabar	South-South	FU
26	Cross River State University of Technology, Calabar	South-South	SU
27	Rivers State University, Port Harcourt	South-South	SU
28	Benson Idahosa University, Benin City	South-South	PU
29	Igbinedion University, Okada	South-South	PU
30	Niger Delta University, Yenagoa	South-South	SU

Source: self-elaboration

Note: Federal University – FU; State University – SU; Private University – PU

In conducting this study, questionnaire was used as a major technique for data collection. A questionnaire was designed because none was available in the literature about the issue. The literature search for relevant background information on e-journals and related issues was used as a source to derive relevant questions. The questionnaire was then read by two colleagues for comment. The questions were designed to study the following groups of variables:

1. Infrastructure for exploiting e-resources, age, and maintenance policy.
2. Users access to e-journals.
3. Annual financial commitments to both e-journals and print, and separate budget for e-journals.
4. University's policy on use of computers for both staff and students.
5. Advantages and disadvantages of e-journals (an open ended question).

In order to support the data collected by questionnaire, interviews and observation, were also used, as visits were made to the universities.

Envelopes containing the questionnaire, a cover letter an addressed and stamped envelope for returning questionnaire were sent out by regular mail on 4th January, 2010. Visits were made to all the participating libraries for two reasons. One, to collect survey questionnaire mailed in advance, if they have not been returned. Two, to observe the infrastructural facilities on ground to support access and exploitation of e-resources and to interact with the staff in charge of e-resources in libraries. Visits to the universities were made between 1st and 26 February, 2010 in the first instance, and between 20th and 28th May, 2010 in the second instance. Some libraries could not complete their questionnaire during the visit for one reason or the other. Out of the 30 questionnaires sent out, 16 were received (53.3% response rate). After the visit, there was a follow up by regular mail, e-mail, and phone call and following these reminders, we received another 6, giving a total response rate of 73.3% (see Table 2. for list of libraries that participated in the study).

The returned surveys were coded and analyzed using appropriate sub programmes of the Statistical Package for Social Scientists Version 15 to describe data collected.

As earlier reported, 22 (71%) libraries returned the surveys, out of these 22, 9 (41%) are from federal universities. 7 (32%) and 6 (27%) are from state and private universities respectively. The subsections in this section are enumerated according to the variable groups enlisted in the methodology section, as they adequately cater for research questions designed for this study.

Table 2. Participating Libraries

S/N	UNIVERSITY	GEO-POLITICAL ZONE	OWNERSHIP
1	American University of Nigeria, Yola	North East	PU
2	Usman Dan Fodiyo University, Sokoto	North West	FU
3	Bayero University, Kano	North West	FU
4	University of Ilorin, Ilorin	North Central	FU
5	University of Abuja	North Central	FU
6	Anambra State University, Uli	South East	SU
7	University of Nigeria, Nsukka	South East	FU
8	Michael Okpara University of Agriculture, Umudike	South East	SU
9	Rivers State University, Port Harcourt	South-South	SU
10	Niger Delta University, Yenagoa	South-South	SU
11	Igbinedion University, Okada	South-South	PU
12	Cross River State University of Technology, Calabar	South-South	SU
13	University of Calabar, Calabar	South-South	FU
14	University of Agriculture, Abeokuta	South West	FU
15	Redeemer's University, Mowe	South West	PU
16	Lead City University, Ibadan	South West	PU
17	Joseph Babalola University, Ikeji-Arakeji	South West	PU
18	Adekunle Ajasin University, Akungba	South West	SU
19	Ladoke Akintola University of Technology, Ogbomosho	South West	SU
20	Federal University of Technology, Akure	South West	FU
21	Pan African University, Lagos	South West	PU
22	Crawford University, Igbesa	South West	PU

Source: self-elaboration
Note: Federal University – FU; State University – SU; Private University – PU

To find out whether libraries have adequate and latest infrastructure facilities that will support the exploitation of e-journals, respondents were asked a question on this. To this, 11 (50%) responded that they have computer and other facilities that were acquired less than 5 year ago (see Table 3). This implies that university libraries have come to realize that the delivery of their services and operations is dependent on a robust IT infrastructure. Our visit to the universities confirmed the existence of the facilities in some libraries. The analysis revealed that 16 (72%) libraries have their computers on local area network (LAN), which allows the sharing of resources with remote computers. It is worthy of note that when a library has made a decision to provide its users with access to electronic information resources, it is taken on a continuity commitments to ensure that both it and the institution sustain an adequate technological infrastructure to allow this access.

Table 3. Computers and their age in Nigerian University Libraries

Institution	Age of Computers				
	Not available	< 5 years	5-10 years	>10 years	Total
Federal	1	2	3	3	**9**
State	0	4	3	0	**7**
Private	0	5	0	1	**6**
Total	**1**	**11**	**6**	**4**	**22**

Source: self-elaboration

The growth of electronic information resources has led to an increased demand for printing facilities and failure to provide adequate printing facilities will be seen as a denial of service. Printers are very important to exploiting e-resources as many find it difficult to read documents on computer screens because of the hazardous effects of ultra violent rays emitted. The vast majority of responding libraries (90%) indicated they have printers although the survey did not elicit information on the type and location within the library. However, our visit to libraries afforded the opportunity to sight some printers in the rooms and areas dedicated to the use of e–resources.

Another important IT facility that is of interest and desirable is Portable Document Format (PDF) readers. This is required for effective and efficient exploitation of –resources. Majority of scholarly articles and journals are now in PDF format, hence it becomes imperative for libraries to install the software on their computers. Majority of responding libraries (72%) indicated that they have the facility on their computers. In a continued attempt to examine ways libraries maintain their IT infrastructural facilities, a question sought responding libraries' views. Responses of libraries to the question show that 16 (72%) have central maintenance system for their IT facilities. Although the scope of the study did not provide for reasons for the adopted maintenance mode, however, experience has revealed that central maintenance of ICT facilities is cost effective, as it removes the swindling tendency found in sourced out outfits in this part of the world. However, 13 of the respondents rely on library systems expert for maintenance of their IT facilities.

Majority of the bibliographic databases (fee-based or free) that libraries subscribe to are web based in the sense that they are accessed via Internet, which aptly explains why librarians around the world invest on Internet access through one source or the other. Table (Table 4) shows the type of Internet access and age in the libraries.

Table 4. Internet Access and age

Age	Mode of Internet Access		
	ISP	VSAT	Total
Less than 5 years	8	9	17
5-10 years	2	3	5
More than 10 years	–	–	–
Total	**10**	**12**	**22**

Source: self-elaboration

We asked how students access e-journals in the libraries. Respondents indicated that students access e-journals via the virtual libraries in majority of the libraries because the facility is available in the institutions. Further, students can access e-journals through their personal computers. Almost all the libraries have facilities for students to connect personal computers to the institutions' network through WIFI technology. Also, many of the universities operate policy that supports student ownership of personal computers. Participating libraries were asked whether they have OPAC or not, and their responses reveal that 8 (36%) have this facility. This suggests that a large proportion of the libraries are yet to automate their routine operations such as cataloguing, serials management, circulation and collection management.

Further, analysis reveals that only 6 (27%) libraries have their electronic journals accessible through the OPAC; the reason for the low number of libraries is because a large number of them do not have electronic catalogue which is vital to the exploitation of e-resources via OPAC. An interesting fact, however, was that of the eight libraries that have OPAC, five are federal universities, while one and two are state and private universities respectively. The question of how best to provide access to each electronic journal has to be fully considered and there is need to build easy-to-use and integrated interfaces to electronic resources, which can be supported and updated.

The participating libraries were asked whether they have separate budget for e-journals. Responses indicate that only 3 institutions maintain separate budgets for e-journals subscription. Interestingly, the three institutions are private universities. It shows clearly here that private universities are indeed determined to build world class collection and also fare better than public universities. The libraries were asked to volunteer information on the amount committed to e-journal subscriptions in 2008 and 2009. Table below displays libraries' responses to the question.

Table 5. Budgetary Allocation to e-journals (2008-2009)

	Amounts Committed to e-journals Subscriptions			
Year	**Less than ^2m**	**^2 – 4m**	**^5 – 7m**	**Total**
2008	3	4	1	8
2009	3	3	2	8

Source: self-elaboration

The universities that volunteered information on their e-journal financial commitment status are categorized below as federal universities – 3; state universities – 2; and private universities – 3; making 8 in all.

As a comparison, we asked about the annual financial commitments to print journals for 2008 and 2009. We received 14 responses (63%) against 2008 and 13 (59%) against 2009 (Table 6). More libraries commit funds to print journal subscriptions than e-journals. This result may be due to two reasons. First, many e-resources are available free of charge, and most libraries would prefer open source to fee-based e-journals. Second, it seems subscriptions to more print journals is predominant in most of the libraries especially locally published journals that have only a few in e-format. A breakdown of responses to this question based on ownership of institutions shows that five federal, five private and three state universities commit more funds to print subscriptions.

Table 6. Budgetary Allocation to print journals (2008-2009)

	Amounts Committed to Print Subscriptions			
Year	**Less than ^2m**	**^2 – 4m**	**^5 – 7m**	**Total**
2008	7	5	2	14
2009	7	4	2	13

Source: self-elaboration

The open question inquired about the policy of libraries guiding the use of computer by staff and students. We received 21 (95%) responses, of which one indicated there was no policy on ground. The remainder, 20 (90%) gave useable information which was processed using the content analysis method to determine the main themes. The responses to each theme varies between three to four.

- Computer literacy is mandatory for all staff
- Staff are expected to have personal computers, however, some are provided with PCs for official use.
- Every senior staff has computer (peculiar to private universities)
- Students are mandated to have personal computers.
- Students are to use e-resources in the virtual library.
- There is computer acquisition scheme for staff.

- Students are issued laptops, and can also use desktop computers in the library.
- Computer access to all students.
- There is a policy for use of e-resources but not computer.
- Students are not allowed to use personal computers on the library's network but can use library computer for academic purpose only.

The responses provided to this question indicate that the universities appreciate the use and importance of information technology in academic environment, for daily academic work and access to online resources. In spite of this, universities would need to show more interest in personal ownership of computer by both staff and students.

The advantages and disadvantages of e-journals identified by responding libraries are very similar to those in other studies. Speed and ease of access, provision of current and massive articles were seen as the main advantages, while the main disadvantages were electricity supply and lack of ICT skills. The general comments of libraries clearly expressed their dissatisfaction with funding, infrastructural facilities and their maintenance. The current study cannot stand alone in presenting final conclusions regarding the issues surrounding e-journals in Nigerian universities for one singular reason: it deals with only 22 universities, out of a total of 102. In spite of this, the study can provide a way forward for university librarians, and indeed heads of other related libraries. Additional studies are needed to examine other pertinent issues that face e-resources, such as the use of EBSCO Host and free online resources in Nigerian universities. It is hoped that such studies will use a larger number of universities. A detailed benchmark for such surveys has been established.

Let us consider how the study answered our research questions:

- Libraries and adequacy of ICT hardware and other facilities. A very significant number of the respondents (73.1%) have their computers on LAN – implying that sharing resources from remote computers go on. Most respondents have also other important IT facilities as printers and PDF readers that are very desirable for effective exploitation of e-resources. Majority of libraries (72%) use ICT unit to maintain their various equipment.
- Access to e-journals. Most of the respondents have Internet access via ISP and VSAT technology. Also, a very high number of the respondents (72%) have wireless internet sensors to exploit e-resources within the conveniences of their offices, classrooms and the environment. The number of libraries using OPAC as access points to locate e-journals are insignificant (36.3%). We can assume that the success rate of automation in university libraries in Nigeria is below average.
- Separate budgets for e-journals. Allocation of separate budget for journals was not popular in university libraries. Only 13.6% of the libraries operate separate budgets, and are private universities. It may be a reasonable

assertion that private universities place premium on e-resources than public universities which was why they operated a separate budget for the e-resources. Budgetary allocation to libraries for print version was significantly higher than e-journals. Annual allocation to print journals double that of e-resources in 50% of the libraries, irrespective of ownership of institutions.

- Policy on the use of computer. The majority of the libraries (77%) have policy for access to e-journals in the virtual library. Though appreciable number of desktops was available for use in most of the virtual libraries visited, almost all the universities encouraged staff to own personal computers.

We offer six recommendations in this final section. In a large part, the recommendations are derived from the problem areas we have identified relating to e-journal management in university libraries in Nigeria. While the problems may not apply to all the universities, we do see these identified problems as opportunities for improvement. Other universities not covered in this study may also have some lessons to learn. Our hope is that our recommendations will resonate on some level, with university library administrators, and heads of related libraries who are in the front lines, and chief executive of such institutions.

1. The funding of ICT infrastructural facilities in Nigerian universities must be improved upon because it is only a robust IT infrastructure that can sustain effective access and online information delivery.
2. Libraries should consider spending a majority of the material budget on e-resources.
3. Automation matter in Nigerian universities should receive more attention and focus. It is on this that a meaningful use of e-journals can be achieved, and will also facilitate integrated access to Internet resources and make the OPAC functional.
4. Library administrators should encourage regular attendance and participation of librarians in conferences, workshops/seminars, particularly those that relate with IT, to enable librarians gain certain competencies that are important to the use ICT to maximize e-resources.
5. Funding dedicated power generating set for library use needs to be accorded priority. It is the only way to deal with the problem of power failure that poses a serious threat to using Internet in Nigeria.
6. University library administrators must develop a set of management tools to compare all the costs of e-journals versus print, or access versus holdings.

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