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Problems of accessing scholarly publications by Nigerian scientists: a study of the University of Ibadan

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Abstract.

This study assesses the impact of information technology on scholarly publications and the problems associated with accessing these publications by scientists at the University of Ibadan, Nigeria. The study discovered that ICT facilities like the Internet and e-mail have taken root in the academic environment through providing access to scholarly publications. However, the implementation of IT application is still a problem to Nigerian academics because of many factors, ranging from the lack of funds to fluctuations in the supply of electricity. This has indirectly affected the level of usage of ICT in Nigeria by the lecturers and it has hindered access to scholarly publications useful for research. Despite many constraints, the use of information technology is growing among lecturers in Nigerian universities.

1. Introduction

The use of information technology for scholarly publication is now commonplace all over the world.

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More than a decade has gone by since the installation of the first automated system in Nigeria. Since then, the level and success of automated systems in Nigeria have varied across different types of establishments, reflecting the uneven development of a process which has advanced in fits and starts rather than as a steady progression.

Developing countries appreciate the significant roles that information generated in developed countries, and available through international information systems, can play in their development [1]. Consequently, the impact of information technology on scholarly communication is increasingly receiving research attention, particularly since the 1990s. Information technology is seen to be transforming the way in which research is conducted. Researchers in developed countries are now able to devise their own strategies, manipulate information in a new way, and study issues which previously would have been difficult to address owing to the variety of the data. They now have access to a variety of sources that they can manipulate, share and discuss with their colleagues all over the world through the use of ICT. However, the bulk of published works in this field is concentrated on the developed countries [1–5]. The sparse literature on developing nations may be due to the inefficient ICT base of these countries. According to Kanamugire [6], 'many developing countries have come to realize that information is crucial for their development.' They have also recognized that under-development of the poor information infrastructure in developing countries has been a major bottleneck in accessing literature, especially through ICT facilities.

The primary role of research in universities is the transmission of knowledge, discovery of new findings, combined with the training of minds. Another role of

universities is to engage in research that could lead to the advancement of knowledge. Through the results of research, universities are expected to contribute to the improvement of the quality of life and to social and technological change [7]. One of the major constraints to research in Nigeria is access to current and relevant scholarly literature in machine-readable formats. Beyond the issue of availability of information technology, the ability of Nigerian libraries to link to the information superhighway has hinged on poor infrastructure, such as electricity and telecommunications, that exists in the country. Working under these circumstances, researchers must choose either to ignore the literature they cannot secure (thus frequently producing redundant, unproductive research) or rely on outside advice for information and research direction.

For many people in modern society the greatest impact of computing technology has been in the workplace [8]. For researchers in the academic community, ICT is necessary to produce quality scholarly publications, especially by providing access to current scientific literature through ICT facilities like CD-ROM and the Internet. The effect of continuous improvements in technologies of computers and telecommunications is already being felt in the way Nigerians go about their business and lives today. Research at the tertiary level is a necessary activity for lecturers to stay in their profession as academics. Hence, the lecturer requires current and adequate scholarly literature in technologies like CD-ROM to direct their concepts and to focus on research work. An academic, according to Itegboje and Okubote [9], is 'expected to expand the frontiers of knowledge in his chosen area of specialization; this means doing research and publishing the results in academic journals'. The use of information technology has facilitated and accelerated information dissemination in such a way that discoveries made in one part of the world can be made available to the rest of the world in a few seconds [10].

In most Nigerian university libraries, relevant publications necessary for scholarly publication are either not available or not up to date. Most libraries do not have the funds to purchase up-to-date journals, especially the international ones; they have to make do with the local journals. Since Nigerian researchers have only a few local scientific journals, which may not be published at very regular intervals, there is a need for these researchers to have access to ICTs that facilitate wider access to scholarly literature. In a study conducted by Ajala [11], it was discovered that researchers in Nigeria constitute the largest group of Internet users in the country. This research dominance, according to Ajala, will be even greater when many publishing companies start to develop their web sites, and when more African researchers have more access to scholarly literature through information technology by linking to the Internet to augment resources in African libraries. The application of information technology in scholarly activities such as the Internet, CD-ROM search, video conferencing, word processing, data analysis, electronic publishing, etc., should result in the overall improvement of the quality of research articles for Nigerian academia. Information and communications available to Nigerian scholars should give access to universal encyclopaedias and electronic publication of magazines, journals and books. Information services such as online research communication and teaching materials that can be shared online with their colleagues in developed countries will also be accessible through the use of ICT. It is therefore necessary that lecturers in Nigeria and other developing countries should not be left out in this 'revolution' taking place in the academic environment.

2. Objectives

This study sought to:
1. investigate the types of information technologies Nigerian academics are familiar with;
2. ascertain the level of utilization of information technology facilities by academics;
3. investigate the impact of these technologies on their research activities.

Answers were also sought to the following questions:
1. What type of information and communication technologies do academics consult when writing a research publication?
2. How often do they use information technology facilities for research purposes?
3. How do academics evaluate the impact of information technology on research publications?
4. What are the problems that hinder the use of information technology for research?

3. Review of literature

Following an increasing recognition of their power and usefulness, many universities and research institutions have acquired ICTs in their libraries. All these developments have raised the expectations of the

research community to access information services in a quicker and more effective way than before [11]. Technological advances in recent years have enabled researchers to exchange ideas from almost any location on the globe. This possibility, according to Koh [12], and the availability of remote databases, has heightened the need for information to be in machine-readable form.

Most developing countries like Nigeria do not have the necessary infrastructure (computer terminals, networks, communication channels, etc.) for ICT. According to a UNDP report, in 1998 only 18.5% of the population of developing countries had a radio, 14.5% had a computer, while 0.05% had Internet access [14]. Information technology applications requiring computers are possible only in locations where this technology is both affordable and available [15]. This means that access to the published literature of the world is a crucial component of institution building. However, most efforts to build libraries and national information systems in Nigeria have not been successful in contributing to information self-sufficiency. This is mainly because these libraries and information centres do not have adequate funds to acquire books, journals and ICT equipment. Msiska [16] agreed with this view by stating that 'no meaningful development of a nation can take place unless the citizens, whether they are decision-makers or ordinary citizens, or those recruited to work in the country, have access to relevant information.' Therefore it is impossible to compare ICT availability and utilization of academics in developing countries with their colleagues in developed countries. This is because the information environment of these 'info rich' and 'info poor' academics in publishing scholarly papers depends on the ability to use and manipulate information technology.

Information technology promises wide access to scholarly publications, yet it also plays a role in screening what is available [17]. The use of ICT facilities like the Internet, according to Lwehabura and Matovelo [13], has 'enabled researchers and scholars in African universities to get access to international online systems and databases, electronic journals and other full-text documents, bibliographic references, factual and numeric data available from libraries and information centres in different parts of the world.' Through ICT applications like CD-ROM, researchers' access to accurate and timely information would be greatly improved, which is an important aspect of research [18]. In his literature survey about ongoing research information systems, Hersey (quoted in Freeman [19]) pointed out that individual students, managers and lecturers use ICT available in libraries to:

1. avoid duplication of work already done or underway elsewhere;
2. locate sources of financial support;
3. stimulate ideas for definition and selection of projects;
4. identify gaps in areas where research has been done;
5. locate individuals with expertise;
6. gain intelligence about the progress of competitors;
7. complement searches of completed research.

In other words, with online services and electronic messaging, the formal submission of papers for publication or discussion, referencing, editing, publication of scholarly papers and posting of notices on electronic bulletin boards have become possible [20]. This has provided a wider access to professional colleagues and friends worldwide and also to teleordering and teleconferencing. Most current statistics on African connectivity indicates that 51 of 54 countries and territories in Africa have Internet access in capital cities. Lwehabura and Matovelo [13] listed the countries with no local Internet access, which include Congo Brazzaville, Eritrea and Somalia. This means that there is a growing awareness among developing countries of the need to build up their information resources as they relate to information technologies.

Science has come a long way from being a pursuit of a dedicated individual interrogating *Nature* to an organized global activity [21], and there is a growing international interest in the impartial evaluation of scientific research. Nigerian academics must not be left behind. Therefore, access to scholarly literature that is enhanced by information technology is crucial to continued scientific advancement and technological progress in any nation.

4. Methodology

This study is aimed at investigating the impact of ICT on scholarly publication of scientists in Nigerian universities. The University of Ibadan, which was established as the first university of Nigeria in 1948, is studied. This descriptive type of study is an appropriate design where the investigator has an opportunity to observe and analyse in greater depth than with other methods [22].

The sample size was carefully chosen to be representative of the characteristics of the group of scientists included in the study. Random sampling was used in

choosing the sample size. The departments used in the study included Chemistry, Botany, Microbiology, Geology, Mathematics/Statistics, Physics, Computer Science and Zoology. The researcher also had personal interviews with some of the lecturers for in-depth clarification of the impact of ICT on their scholarly publication.

The instrument used for data collection was a structured questionnaire. The questionnaire consisted of two sections. Section I included the biodata of the respondents and information on their computing knowledge while section II consisted of questions on the impact of ICT on their publication.

5. Data analysis and discussion

Two hundred copies of the questionnaire were distributed among lecturers in the Faculty of Science and, in a return of 128 (64%), all copies were found to be usable. The following results were obtained from the 128 copies analysed.

As shown in Table 1, the distribution of the respondents by gender indicates that there were more male lecturers than female lecturers in the faculty. The majority of the lecturers indicated that they were computer-literate, while few lecturers had no knowledge of how to handle a computer. The lecturers who participated in the study included all levels, as shown in Table 1, except graduate assistants, who were not included in the study because they were still in training positions.

The respondents were asked about their number of years of experience of working with computers (Table 2). The survey results revealed that the largest percentage of respondents had been using ICT for

Table 1
Summary of respondents' characteristics

Characteristics	Category	Percentage
Gender	Male	77
	Female	23
Computer literate	Yes	76
	No	24
Post	Professor	13
	Reader	4
	Senior lecturer	25
	Lecturer I	32
	Lecturer II	26

Table 2
Years of computer working experience

Years	Frequency	Perc
1 year or less	23	18
2 years	39	30.
4 years	23	18
5 years or more	43	33.8
Total	128	100

publishing their scholarly publications for over years, which shows that they are quite familiar the use of ICT.

The study also revealed that only 32.8% of resp dents owned a personal computer. Nevertheless, the high level of awareness of importance of ICT am academics in Nigeria, many more will acquire th own computer provided they have the funds. Niger universities have been hit by drastic budget cu which have seriously affected the academic comm nity. However, the Academic Staff Union of Niger Universities (ASUU) has recently asked the Gove ment to make available grants for lecturers to buy th own PCs in order to aid research activities.

The lecturers were asked where they made use ICTs for their research. Figure 1 shows that most of th respondents patronized business or commercial ce tres, while a few of them used the library, the personal offices or homes. This indicates that majority of Nigerian academics still depend o commercial centres to use ICTs. The 11% who use ICT at home were those respondents who owned thei own computers.

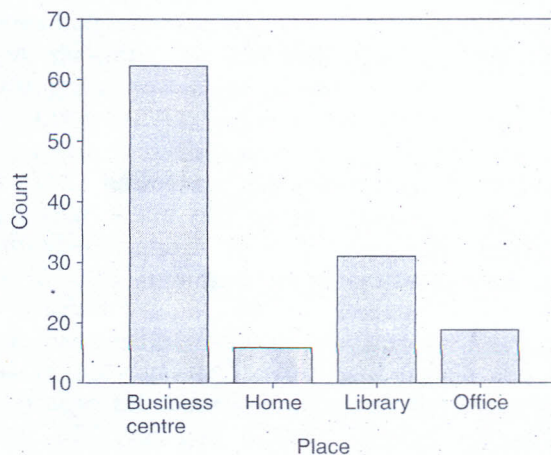Fig. 1. Places where ICT is utilized.

Table 3
Rank order distribution of different IT tasks used for research

Task	Frequency	Percentage
Word processing	121	94.5
E-mail	115	89.8
CD-ROM search	92	71.8
Internet browsing	83	64.8
Statistical analysis	68	49.2
Database	21	16.4
Facsimile	16	12.5
Web site design	—	0
Electronic bulletin boards	—	0

Fig. 2. ICT-based facilities consulted for research articles.

The study as shown in Table 3 reveals that a majority of Nigerian lecturers used ICTs for word processing, e-mail, CD-ROM search and Internet browsing, while few lecturers used it for statistical analysis, databases or facsimile. None of the respondents had ever used electronic bulletin boards or web site design for their research communications, which shows that ICT has acquired a new importance in scholarly publications and research among Nigerian scholars. Information technology allows for coordination, accumulation, criticism and communication between researchers over geographical distances through the use of CD-ROM, e-mail and the Internet, and these ICT facilities have great potential. Without them, Nigerian researchers will find it difficult to access scholarly literature that will help them to produce research publications of quality.

Apart from normal information sources like books, journals, magazines, etc., lecturers were asked about the ICT-based sources that they consulted during research. The study, as shown in Fig. 2, revealed that respondents used more of the CD-ROM and Internet facilities for literature search while other databases, OPACs and electronic journals were consulted for scholarly publication by only a few of the respondents. ICT facilities such as electronic journals are of enormous potential benefit to users, and Nigerian researchers are yet to benefit fully from this. Without adequate access to electricity, telephone system, computer, up-to-date software and Internet access, electronic journals will be completely useless to the Nigerian researcher as a source of literature. It is this researcher's opinion that some of the respondents did not actually know what the electronic journal is and how it can be used; respondents that do consult the Internet may have browsed through some electronic journal web site(s) without realizing it.
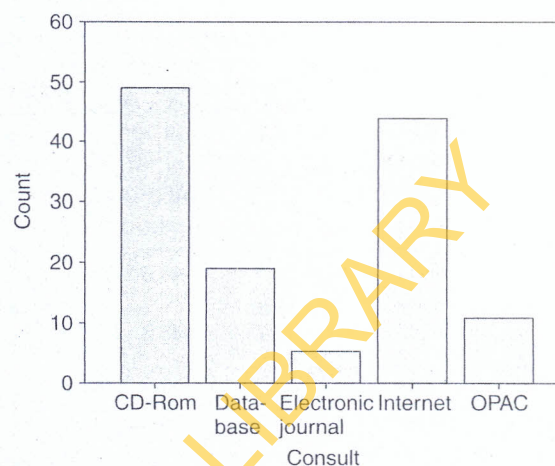
This study also revealed that 125 (97.7%) respondents agreed that ICT has a very important role to play in their research, while only three (2.3%) lecturers disagreed. It was discovered that these respondents were professors who had reached the peak of their career. This confirmed that lecturers in Nigeria have come to realize that ICT has an important role to play in scholarly communications. Moreover, university research in Nigeria seems to be conducted mostly to earn promotion as most of the researchers are relatively new PhD holders, while, unfortunately, the professors seem to be overwhelmed by the constraints of teaching and administrative chores, allowing them very little time for research [7]. They were also asked to evaluate whether the use of ICT for their scholarly publications had increased the cost of writing research articles. A majority, 94 (73.4%), agreed while 26 (20.3%) disagreed and eight (6.3%) did not respond. Only 55 (43%) of the respondents had sent their research papers for publication using ICT facilities, while 73 (57%) had never done so. This study also discovered that 93(72.7%) of the respondents had never published articles in any electronic journal, while 35 (27.3%) had had work published in an electronic journal.

There are parallels between the results of Costa and Meadows' [1] study and this investigation, as shown in Table 4, because all the respondents in both studies agreed that ICT has had a great impact on their research. This suggests that Nigerian lecturers have accepted that automation is the next stage in the evolutionary path in publishing research articles.

The respondents were asked how often they used ICT facilities for their teaching activities and research. Fourteen per cent indicated that they used ICT daily,

Table 4
Respondents' evaluation of the impact of ICT on research publications

Impact	Response							
	Agree		Undecided		Disagree		No	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Increase informal communication	121	94.5	5	3.9	2	1.6	—	—
Improve quality of work	122	95.3	6	4.7	—	—	—	—
Widens the scholarly community	125	97.7	3	2.3	—	—	—	—
Increases publication	89	69.5	25	19.5	14	10.9	—	—
Produces more work in less time	106	82.8	6	4.7	14	10.9	2	—
Improves creativity	116	90.6	6	4.7	6	4.7	—	—
Makes it easier to find relevant information	124	96.8	4	3.1	—	—	—	—
Makes it easier to put publication together	106	82.6	16	12.5	6	4.7	—	—

Table 5
Rank order distribution of problems encountered by respondents in using ICTs

Problems	Frequency	Percentage
Fluctuation of electricity supply	107	83.5
Lack of funds	98	76.5
Exorbitant charges	40	31.3
Not familiar with software used in libraries	37	28.9
Lack of computer knowledge	29	22.7
Feeling uncomfortable with the technology	8	6.3

58% used it weekly, 7% monthly and 21% occasionally. A majority of Nigerian lecturers are yet to use ICT facilities for their research on a frequent basis. Financial constraints may be responsible for the under-utilization of ICT (Table 5).

6. Conclusions and recommendations

The findings of this study show that Nigerian academics appreciate the value of using ICT for teaching, research and publications. Information technology facilities like CD-ROM, the Internet etc. may be the beginning of the advent of libraries without books in Nigeria, but Nigerian academics still have a lot of hurdles to clear before they can benefit from these technologies as a source of producing and gaining access to scholarly publications. This is essential for them to integrate their work as part of a coherent whole rather than remaining isolated, especially when their means of communication are limited. The necessary infrastructure for ICT in Nigeria is not available and ICTs are still seen as luxury items. Literature that can be accessed on international databases through the use of ICT facilities has connected academics to relevant literature worldwide. However, researchers are constrained by high fees that have to be paid in order to gain access to literature. Researchers in Nigerian universities engage in quality research, but lack of funds, especially through foreign exchange, and other infrastructural problems, makes it impossible to access the necessary literature.

In a study conducted by Tiamiyu [23], the main three factors were listed that appear to account for this undesirable situation in Nigeria:

1. the dramatic decline in the nation's economic prosperity since the early 1980s, which has forced production and expenditure decisions in favour of necessities only;
2. the poor status of ICT-supporting infrastructure (electricity, telecommunications, etc.), which makes it difficult to achieve an appreciable return on ICT investment; and
3. the international economic sanctions, which precipitated a poor investment climate which in turn prevented the free flow of funds, ideas and technologies that could have helped to modify or replace the entrenched traditional information management cultures with a modern ITC-oriented culture.

Nigerian academics have to publish researched articles to meet with their colleagues in other parts of the world. Moreover, the Nigerian academic has to battle with either 'publishing' research articles or 'perishing' in their chosen career. Thus, researchers in Nigeria need pools of diversified knowledge through scholarly literature, especially in electronic formats made available by ICT to prepare their reports, courses of study and to know the results of research activities. Nigerian academics should not be left out of the new developments and progress that have been made by their colleagues all around the world. This means that access to the published literature of the world through information technology is a critical component of institution building. Through ICT application, Dulle [18] states that researchers' access to accurate and timely information could be greatly improved and this is an important aspect for research.

Following an increase in the use and recognition of the power and usefulness of ICT, many universities around the world have established the use of ICTs in their libraries. By linking information resources, Nigerian library centres should aim to facilitate information sharing among researchers with the use of ICT. Also, university authorities in Nigeria should make available ICT facilities in faculties and departments, for research purposes and not for administrative use alone, so as to reduce the number of lecturers having to use commercial centres. With this, the use of ICTs in Nigerian universities and academic libraries will enable the development of new bibliographic databases and the use of existing bibliographic databases, online information retrieval, online access to library collections and location of items for inter-library loan.

To raise the impact of IT on research publication, information technology needs to not only be available, but also to be used as a source of information. Therefore, universities in Nigeria should encourage their lecturers to publish articles in electronic journals.

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