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Information Needs and Seeking Behaviour of Engineers in Ghana: A Case Study of the Volta River Authority

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Abstract

The purpose of this study was to find out the basic information needs of engineers of the Volta River Authority (VRA), Ghana, and to determine the various factors that influence their information seeking behaviour, in order to facilitate the provision of timely and adequate information. Copies of the questionnaire designed were distributed to a sample of 86 (74.7 %) engineers out of a population of 115. Of the 86 copies, 55 (63.9 %) were completed and returned to the researchers. The study revealed that the engineers required detailed, brief, as well as, factual information to perform their jobs. Their search for information was influenced by the need to solve a problem, gain knowledge or make a decision. Although the engineers rated the provision of library facilities at their work place as important to their work, they usually consulted their colleagues, their personal library at home, the Internet or relied on their memory, when pressed for information. The library and information centres were consulted only as a last resort. Other sources of information vital to the job success of the engineers were external conferences, external experts, internal conferences, and VRA information resources. It is recommended that information packaging should be vigorously pursued in order to meet the needs of the engineers and also to extend library and information services to all branches of VRA.

Introduction

The Volta River Authority (VRA) is the organisation mandated to generate, transmit and distribute electricity to all sectors of Ghana's economy. Thus, it is committed to being the leading supplier of high quality electric power at the least cost, and at the same time ensuring the satisfaction of its stakeholders. It aims to manage a portfolio of viable business in the generation, transmission, distribution, telecommunication and other energy infrastructure and related services within a privatised business setting. A flow of uninterrupted information is very crucial to the achievement of the stated objectives of VRA. This was echoed by the VRA official responsible for environmental and sustainable development, when he said in the *Ghanaian Times* newspaper of Thursday, 10th February, 2005, that "Ghana's main hope for development is on electrical power and any break in electricity production would send us far back ... As a matter of urgency, we in Africa must also realise that information is one of the resources needed to expedite our pace of development".

The National Democratic Congress (NDC) government's road map for Ghana's development and growth, *Ghana-Vision 2020* (1995), noted that constraint on energy supply, especially electricity, is one of the factors which have slowed down the rate of economic growth in recent years. The document explained further that despite the constraints, electricity consumption has been rising at an annual rate of 7%, and will continue to increase. As economic growth accelerates, energy consumption will shortly exceed the installed power generation capacity of the VRA. To avert this constraint, there must be uninterrupted access to information for VRA engineers to facilitate their

ability to solve the pressing problems that they encounter in their daily routines in the VRA.

The provision of constant and uninterrupted supply of electricity is fundamental to development, economic growth and social well-being of every town, village, and locality. Therefore, all sectors of the economy rely greatly on VRA for the generation and supply of this commodity. It is important to note that various options for power generation such as biomass, petroleum, biogas, hydro, thermal, nuclear or solar are available for VRA to exploit, in order to satisfy the energy needs of Ghana. The ability of engineers of VRA to make informed choices and appropriate decisions, depends largely on the provision of timely and adequate information on the available options, such as cost factors of the various options, as well as what competitors in the energy market have to offer. Adequate and up-to-date information is clearly of paramount importance to organisations, in order for their target goals to be attained. Furthermore, the availability, flow and sharing of the right type of information will definitely provide the platform on which problems encountered in power production and supply can be tackled and resolved.

In 2000, a survey was conducted into the establishment and re-organisation of technical libraries in the VRA at the instance of the Authority. This means that VRA as an organisation attaches great importance to libraries and other information units as vital supporting units in the Authority's operations. The study focused mainly on available resources, especially book materials, with no mention made of project and other related documents, which form the bulk of materials that the engineers in VRA use. The study recommended the establishment of technical libraries. Unfortunately, the study failed to investigate the specific information needs of the engineers, and how they go about looking for information to satisfy their needs (Ellis, 2000). It was in order to fill this knowledge gap that this study investigated the information needs and information-seeking behaviour of engineers of the Volta River Authority.

Literature Review

A number of studies have documented the information needs, information-seeking behaviour and the relationship between information use and work performance. According to Chin-chih and Hernon (1982), information needs arise whenever individuals find themselves in a situation requiring knowledge to deal with the situation as they deem fit. Ocholla (1986), in a preliminary study of the information-seeking behaviour by academics at Moi University in Kenya, established that a good number of the academics depend on libraries and colleagues for information. This is supported by Ajayi (2005), in a study on information seeking by nurses at the Obafemi Awolowo University Teaching Hospital in Nigeria. The study cited other studies (Childs, 1988; Thomas, 1983) that emphasised that nurses use a variety of information services, both formal and informal, including the use of public libraries, private purchase of journals and contact with colleagues.

Over the years, research on information and work performance of engineers has noted that information plays an important role in the development of successful team projects (Allen and Cohen, 1969; Allen, 1977). To function properly in a rapidly changing industrial environment, engineers interact with a variety of information, and the factors that affect information seeking are getting more complex and dynamic by the day. The industry seems to be shifting from a sequential to concurrent engineering processes in order to reduce the product development time. Shina (1991) defined a concurrent engineering environment as the earliest possible integration of the overall company's knowledge, resources and experience in design, development, marketing, manufacturing, and sales into creating a successful new product. Wolek (1996) has however illustrated that the works of engineers do not always encourage a continual integration of new ideas within the existing practice. Their works begin with systems definition, during which the engineers make use of extensive information sources. The next stage is the prototype testing phase, during which information needs become increasingly less, as the designed model becomes more and more acceptable.

In summary, literature on information needs and information-seeking, acknowledges that work-related information seeking is different from everyday information seeking. In addition, the different characteristics of various work environments make one type of information seeking different from the other. Therefore, it is beneficial

to study one group of information seekers at a time, and use the results to develop user-oriented information systems, in order to serve them better.

Various studies conducted to define the information needs of engineers reveal that personal contacts with either colleagues or suppliers play a more significant part in their information transfer than printed sources. The differences in their information use are only dependent on the engineers' roles, rather than the industry or subject field they might be working in. Anthony et al. (1986) pointed out that engineers are the people who publish less; who tend to consult only readily available sources, and they are more easily deterred by lack of success in finding information sources. They prefer informal contacts to a formal information system, and would rather listen and discuss than read journals and other literature. This is because they find using printed information sources very troublesome, and so they reject them, possibly due to inadequate awareness of the real benefit they can derive from such sources.

Kwasitsu (2003) carried out a study on information-seeking behaviour of the design, processing and manufacturing engineers in an international microchip manufacturing company. His study centred on information sources the engineers used, and the characteristics that influenced their information selection. His findings reveal three important things:

- There are significant differences in information-seeking behaviours of the engineers.
- The higher the engineers' level of education, the less likely they would depend on their personal memories as sources of information, and the more likely would they rely on libraries.
- The higher the level of education, the less likely engineers were to consider "personal mastery" (information tool mastery) as a source influencer.

Pinelli (1991) also identified three main deficiencies in meeting the information needs of the engineer. They as follows:

- The specific information needs of engineers are either not well known or not well understood.

- What is known about the information-seeking habits and practices of the engineers has not been applied to existing engineering information services.
- Information professionals continue to over-emphasise technology, instead of concentrating on the quality of the information itself.

Objectives

Current trends in effective information science lay emphasis on the need to be acquainted with and understand the specific information needs of users, in order to determine their information habits and provide services tailored to them. In addition, what is known about the information-seeking habits and practices of the users should be applied to existing information services. Accordingly, the study investigated the information needs and information seeking behaviour of VRA engineers, with a view to determining the various factors that influence their information-seeking behaviour and consequently suggests appropriate means of information service delivery to the engineers, in order to enhance their work.

Methodology

The VRA has branches in most parts of Ghana, where engineers performing various duties are located. The entire work force of engineers in VRA is 115, distributed to the various branches as follows: Accra, 3; Akosombo, 18; Akuse, 45; Takoradi, 20; Tema, 13; and the Northern Electricity Department (NED), 16. The NED represents substations of VRA in the northern parts of Ghana. A questionnaire was distributed to a sample of 86 engineers, representing the 74.7% of the total population of engineers in VRA. Of the 86 copies of the questionnaire distributed, 55 (63.9%) were completed and returned to the researchers. The researchers also had the opportunity to interview a few engineers who could spare some time. This study was carried out in 2005.

Findings

Work Habits

Respondents were asked to describe their weekly work habits by estimating the number of hours they spent on activities such as attending meetings, managing people, reviewing and reading journals, reading and responding to electronic mails. Forty-nine (89.1%) respondents indicated varied numbers of hours they spent attending meetings. Out of this, 20 (36.3%) of the respondents spent over three hours, while 31 respondents (56.3%) spent between one and two hours attending meetings. This means that there is an appreciable level of interaction and communication among the engineers. This corroborates the findings of Wilson et al. (1979). These researchers revealed that attending meetings play a significant role in the working week of people in the higher hierarchy of organisations, and that

confirms the importance of electronic mail in the work life of engineers. Again, 40 respondents (72.7%) reported that they spent between one and four hours a week managing people while five respondents (9.1%) reported that they spent more than four hours a week performing this task. They include directors, managers and supervising engineers. The findings actually support the effects of work role on the work habits of the engineers.

Information Triggers

Respondents were asked to state the activities that led them to look for information. Twenty-three respondents (41.8%) indicated that solving a problem leads them to look for information most of the time. This was followed by curiosity to be informed (40%), and decision-making (36.4%). Table1 summarises data on the information triggers.

These findings corroborate the findings of

Table1: Information Triggers

Category	Most of the time	Half the time	Occasionally	N/A
Orientation to solve a problem	23 (41.8%)	11 (20.0%)	16 (29.1%)	5 (9.1%)
Curiousity to gain knowledge	22 (40.0%)	25 (45.5)	7 (12.7%)	1 (1.8%)
Making a decision	20 (36.4%)	15 (27.3%)	14 (25.5%)	6 (10.9%)
Meeting a demand	14 (25.5)	20 (36.4)	13 (23.6)	8 (14.5)
Exploring idea for work group	12 (21.8%)	20 (36.4%)	19 (34.5%)	4 (7.3%)
Planning a project	12 (21.8%)	22 (40.0%)	12 (21.8%)	9 (16.4)
Exploring an idea for a seminar	9 (16.4%)	8 (814.5%)	28 (50.9)	9 (76.4)
Confirming an idea	9 (16.4)	19 (34.5)	23 (41.8)	4 (7.3)

N= 55

useful and significant pieces information are picked up or shared at such meetings. The data gathered from some of the interviewed engineers revealed that a lot of information exchange took place at their periodic meetings.

It was also gathered from some respondents that the electronic mail system plays a major part in information sharing among work groups. This was confirmed by 50 (90.9%) of respondents, who stated that they spent at least one hour reading e-mails, and 49 respondents (89.1%), who spent the same time sending e-mails. Hirsh (2000) established that electronic mail processing plays a very vital role in the work week of engineers in the research and development environment. Data for this study

Kwasitsu (2003) on how work roles of design, processing and manufacturing engineers influence their information needs. He quoted Leckie, et al. (1996), who in their work, asserted that specific work roles and task of healthcare professionals, lawyers, and engineers were determinants of their information needs.

The engineers in this study carried out various job assignments such as project implementation and management; contract administration; electrical, civil and mechanical maintenance of plant and equipment; system/project planning and development; and technical development and management. Others are design and specification of projects; systems and equipment; technical and work audit; power generation transmission and

distribution; power sales; transport and security services; training; corporate administration; as well as general supervision and administration of works.

Unlike the design, manufacturing and processing engineers in Kwasitsu's (2003) research, the engineers in this study need to gain a lot of knowledge about projects, contracts and their related concerns, in order to make decisions about a problem. This explains the close relation in the responses for the first three categories of information triggers among the VRA engineers. It is also not surprising that two of the variables – exploring ideas for workshops and for seminars, scored lower percentages in responses. Little effort goes into these activities because, over the years, VRA has developed its own specifications for the works that are carried out, and thus there is no need to re-invent the wheel. This is further explained in the types of information engineers said they needed in order to accomplish their works.

Types of Information Needed
In an open-ended question format, respondents were asked to state the types of information they needed to accomplish their jobs. A wide range of job-related information types were stated, which categorised into eight groups for convenience of analysis. As expected in most engineering environments, VRA engineers used technical information most of the time. This information type comprises literature on civil, electrical and mechanical engineering and dam safety, design and other standards, power generation technology and maintenance manuals, equipment, materials and tools standards, among others.

Table 2: Types of Information Need

Information Type	Number	(%)
Technical Information	39	70.9
Specification	19	34.2
Management \Planning	11	20
Financial Information	11	20
Contract Document	10	18.2
Pricelist	9	16.4
Legal Information	2	3.6
Others	9 (16.4%)	16 .4

N= 55

Technical information is very important in engineering and its related activities and operations, as pointed out by Anthony, *et al.* (1986), "underpin today's technology-based world and they are the essential common language of engineering". Without them, no building, no structure, no machine could be brought into useful existence. To add to this statement, it is fair to say that without standards, no machinery could be operated, maintained or managed. Consequently, in order to maintain a standard mode of operation, VRA engineers rely a lot on technical information and specification, and apply them accordingly. Specifications are used, alongside technical information. They include: contract specifications, product specifications, equipment specifications, technical specifications, client specifications, and quality and quantity requirements, among others. The information gathered is used for various reasons during the execution of their duties.

Information / Document Sources
Respondents were also asked to rate the importance of various information sources. A great number of respondents (92.7%) indicated VRA project documents and technical specifications as being highly important sources of information. This was followed by professional journals (67.3%); conference papers (56.4%); and academic journals (52.7%). Data on the other information sources are presented in table 3 below:

Table 3 Information Sources/Documents

Information Source	Number	%
VRA Project Document	51	92.7
Technical Specification	51	92.7
Professional Journals	37	67.3
Conference Papers	31	56.4
Academic Journal	29	52.7
Product Information	15	27.3
Govt. Information	15	27.3
White paper	6	10.9

N= 55

The responses in table 4 correspond to the laid down structure and formula that apply during job executions in VRA. In an interview, one supervising engineer disclosed that over the years, VRA has developed its own specifications. These specifications are used for works that are carried out in the power system operation, expansion and real estate development. This was achieved through the modification of available standards and specifications on the open market to suit the specific needs of VRA, as applicable to power systems. The engineers, therefore, prefer making reference to existing VRA documents, manufacturers' brochures and other documents which have been used before in the VRA system and operations. Explaining this further, one engineer interviewed stated that

agreed with Anthony, et al. (1986), to confirm that engineers have a psychological predisposition to solve problems by themselves, drawing heavily on the past experiences of colleagues who are known to be efficient in the field, rather than finding answers in literature. He also explained that engineers' need for information is generally in the form of handbooks, standards, specifications and technical reports.

In a follow-up question, the engineers rated VRA information sources or information centres (76.4%) as highly important sources, from where they obtain most of the needed information in reading or reference materials. This was followed by the Internet or the World Wide Web (65.5%) and own/personal files (54.3%). The rest of the results are shown in table 4.

Table 4: Important Information Sources

Information Resource	Highly Important	Moderately Important	Least Important
VRA Information Sources	42 (76.4%)	10 (18.2%)	2 (3.6%)
Internet	36 (65.5%)	16 (29.1%)	3 (5.5%)
Own Business Group	31 (56.4%)	16 (29.1%)	2 (3.6%)
Standard ORGANISATION	30 (54.5%)	13 (23.6%)	8 (14.5%)
Own/Personal Files	30 (54.5%)	21 (38.2%)	2 (3.6%)
Own/Personal Memory	28 (50.9%)	22 (40.0%)	4 (7.3%)
VRA Conferences	28 (50.9%0	18 (32.7%)	3 (5.5%)
Professional Associations	26 (47.3%)	20 (36.4%)	5 (9.1%)
External Experts	24 (43.6%)	20 (26.4%)	6 (10.9%)
External Conference	15 (27.3%)	26 (47.3%)	5 (9.1%)
Other Business Group	12 (21.8%)	29 (52.7%)	8 (14.5%)

whenever a project comes up, the first issue in VRA is to look at the precedent that has been set, since most issues have occurred before, and all that is to be done has once upon a time been done in VRA. Reference to other literature always requires tailoring whatever information is acquired to suit the needs of the VRA.

This finding is supported by the work of Pinelli (1991), who distinguished between scientists and engineers. He pointed out that the main goal of an engineer is to produce or design a product, a process or a system. They also work within time the constraints and so prefer informal sources of information, especially by conversing with individuals in the organisation. Again, Pinelli (1991)

The above results truly reflect the findings on the documents sources that the engineers use. The VRA project documents are found only at VRA information resource centres. The importance of VRA information centres was further explained in the engineers' responses to another question. Results show that the libraries are rated highly important to the engineers; (38.29%) as against (18.2%) for archives and registry respectively, and (10.9%) for the printing unit.

Choice of Information Sources

Respondents were asked to assess how the various characteristics of information sources influenced their selection of information sources. Majority of

the respondents, as shown in table 5, (76.4% to 90.9%), stated such factors as quality of information, its reliability, relevance and accessibility as very high influencers of their choice of information or document sources.

Table 5: Influences of Information Choices

Influence	Highly Influential	Moderately Influential	Least Influential	N /A	Total
Quality	50 (90.9%)	1 (1.8%)	1 (1.8%)	3 (5.5%)	55 (100%)
Reliability	48 (87.3%)	5 (9.1%)	_	2 (3.6%)	55 (100%)
Relevance	42 (76.4%)	9 (16.4%)	1 (1.8%)	3 (5.5%)	55 (100%)
Accessibility	42 (76.4%)	9 (16.4%)	1 (1.8%)	3 (5.5%)	55 (100%)
Availability	37 (67.3%)	12 (21.8%)	3 (5.5%)	3 (5.5%)	55 (100%)
Ease of use	31 (56.4%)	16 (29.1%)	4 (7.3%)	4 (7.3%)	55 (100%)
Currency	26 (38.2%)	18 (32.7%)	6 (10.9%)	5 (9.1%)	55 (100%)
Experience	21 (38.2%)	23 (41.8%)	7 (12, 7%)	4 (7.3%)	55 (100%)
Personal Mastery	19 (34.5%)	20 (36.4%)	7 (12.7%)	9 (16.4%)	55 (100%)
Technical Jargons	4 (7.3%)	24 (43.8%)	16 (29.1)	11 (20.0%)	55 (100%)

N= 55

These findings support the evidence given by Pinelli (1991) that engineers rate technical quality or reliability of information as highly influential in their choice of information sources. This was followed respectively by relevance (76.4%) and accessibility (76.4%). It is not surprising that technical jargons least influence the engineers' selection of information sources. According to one of the directors interviewed, technical jargons of engineering terms are not considered much when they search for information. He explained that the most important concern of the engineer in VRA is to be sure that the information being used is relevant, reliable and of quality, bearing in mind that he would be able to defend his position whenever a problem arises. This explains the high ratings for the first three information source influencers – quality, reliability and relevance.

Accessibility to Job-Related Information
Respondents also rated where information needed for their job was most readily obtainable. Twenty-three respondents (41.8%) indicated that information they needed was most readily available "within VRA". This includes VRA information resource units, office libraries (files and documents), VRA business groups and contact with colleagues. Seventeen respondents (30.0%) indicated a

combination of "within VRA" and external sources as their most readily available source of information, while seven respondents (12.7%) indicated "within VRA" and personal files as their most readily available source. External sources include the Internet, standard organisations, external experts and client organisations. Personal files include personal notes and personal memory. From observation, the obvious thing that the engineers do when faced with a problem, is to attempt solution based on their personal wits and experience.

Keeping Abreast with Job-Related Information
When the respondents were asked to state how they kept abreast with job-related information, two variables *consult personal notes* and *browse the Internet*, were the major- sources used by respondents. This was reported by (85.5%) of respondents each. These were closely followed by those who consulted their colleagues, (72.7%) of respondents; and those who consulted the library (54.5%) of respondents, to keep abreast with job-related information.

Libraries and information centres are considered the first port of call for updating information. Obviously, keeping abreast with information means reading lots of engineering literature and consequently, visiting libraries and information centres, but the study data suggests otherwise. To explain this trend, Pinelli (1991) opined that engineers read less than scientists, and they seldom use information services which are directly oriented to them. Also, they do not want collections of documents that must be sifted,

evaluated and translated before applying to their works. Rather, they want specific answers presented in terms and formats that are intelligible to them. To make a deduction from this, it is not surprising that VRA engineers consulted the library less than they consulted personal notes, the Internet and their colleagues. Typically, engineers prefer informal information networks to the more formal sources of publicly available and catalogued information. Somehow, the emergence of the Internet and the World Wide Web has taken over the role of the library in this instance.

Problems in Information Acquisition

Another open-ended question explored problems the engineers encountered in acquiring job-related information. Responses covering a wide range of problems and challenges were stated. These problems and challenges were categorised as inadequate information, delay and time-constraint, unreliable Internet service, unavailability of information, inaccessibility of information and cumbersome information retrieval systems/lack of retrieval skills. Respondents indicated multiple challenges that they faced in information retrieval. The results are presented in table 6 below:

Table 6: Information Challenges

Problems	Number	(%)
Unreliable Internet Service	16	29.1
Delay/ Time Constraints	15	27.3
Unavailability of Information	12	21.8
Cumbersome IRS/Lack of Skills	12	21.8
Inaccessibility of Information	11	20.0
Inadequate Information	10	18.2

N= 55

Research data reveals that the VRA information system is not devoid of problems. Prominent on the list of problems stated are unreliable Internet service and delay/ time constraints in getting information. It could be inferred from the responses that some very important characteristics (timeliness, reliability, accessibility and adequacy), of useful information are lacking in the VRA information system.

Problems in information-seeking, most of the time restrain and discourage users from consulting information centres or resources, as supported by earlier researchers in the field. For instance, Leckie, *et al.* (1996) pointed out that timeliness of information is vital to the work of engineers. They explained that whether a need is planned or unforeseen, it is often important that information is obtained immediately or within a reasonable amount of time, in order to maintain its usefulness and impact, as it coincides with the need. On accessibility to information, Wilson (1997) asserted that a fundamental requirement for information-seeking is that of accessibility, and that inaccessibility to information may inhibit information seeking and impose a higher cost than the enquirer is prepared to pay. He also pointed out that information sources need to be credible to prove the reliability of information, both in quality and accuracy.

Conclusion

This study presented the result of a survey of the information-seeking behaviour of engineers of VRA. It was found that engineers require detailed, brief and factual information to perform their jobs. Although the engineers rated the provision of library facility as important to their work, they usually consultED their colleagues, their personal library at home, the Internet or rely on their memory when pressed for information. The library and information centre, although very essential to the survival of their jobs, were consulted mostly as a last resort. The following sources of information are also vital to the job success of the VRA engineers: external conferences, external experts, internal VRA conferences, and VRA information resources. Their personal files, members of work groups and people from professional associations, other groups and standard organisations are also vital for a successful task completion.

Information influencers, such as accessibility, availability, and familiarity of source consulted – determine the suitability of the information for the VRA engineer. Other parameters are technical quality, reliability and relevance of the information to the problem at hand, currency of the information, as well as its accuracy. Although the engineers rated the Internet as one of the most important sources of information, they also stated that information flow

via the VRA library was slow, and therefore requested, among others, the availability of accessible Internet service at all times (Broadband access) and well equipped library with up-to-date information on current trends and technological applications.

Recommendations

The following recommendations are made for more effective information provision for the engineers of VRA. The information communication technology (ICT) is rapidly changing the world with major impact on the way we live and work (IConnect Ghana, 2003). ICT services that concentrate on how organisations can best meet their goals is very crucial for the efficiency and effectiveness of the VRA. Being the main energy source for industrial, domestic and commercial activities in the country, efforts must be made to improve information flow for prompt decision making, which will enable effective action to be taken, so as to meet the corporate vision of the Volta River Authority. It is therefore recommended that:

- Investigations should be conducted into the issues that present challenges in information search and retrieval, to enable information and information services to be packaged in the right format for prompt delivery. This should help in reducing problems that engineers face when looking for information. In addition, a cost benefit analysis of the role of information and information centres in VRA should be conducted, in order to establish the vital role that information plays in VRA.

- In 2000, a survey was conducted into the establishment and re-organisation of technical libraries in the VRA (Ellis 2000). This survey was institutionally initiated by VRA. This means that VRA as an organisation attaches great importance to libraries and other information units as vital support units in their operations. This current research into the information needs and information-seeking behaviour of engineers in VRA should further boost the perception by VRA management and workers concerning the role that information centres and libraries play in the success of the organisation. It is suggested that the management of VRA, in collaboration with the librarians, should provide orientation for the engineers to appraise them of the importance of the library and the kinds of information resources and services that are available to them.

- There should be improvement in the Internet service provision for faster information flow. This can be done through the introduction of Broadband access, which is a high-speed Internet access facility, which makes use of existing telephone lines (Asymmetrical Digital Subscriber lines). This is a new technology which converts existing twisted copper wire lines into high speed, high bandwidth digital lines to provide Internet access. Some benefits of Broadband are high speed, reliable and accessible data, and electronic mail.

- The provision of library and information services should be extended to all VRA branches, and library specialists should be assigned to the various libraries, in order to enhance effective service delivery. This is to ensure that all engineers, irrespective of their work location, will have equal access to needed information to solve persisting work-related problems, which will eventually reflect in a smoother flow of electrical energy to all parts of the country.

- There should also be formal instruction (user education) organised by the library staff for the engineers, in order to sharpen their skills in information search and retrieval. This is very important, because it will help engineers to use the library resources effectively and efficiently to obtain the desired information, and to develop the skills in using library resources independently. This could be carried out through one-on-one sessions or by classroom instruction.

- The main library in Accra should intensify the selective dissemination of information (SDI) service via the Internet, in order to meet the current information needs of the engineers. This will surely relieve the engineers from the problem of sifting through large volumes of documents before getting relevant information.

- Further research would be required to determine the extent to which engineers depend on their colleagues for information, and how library and other information services can be tailored to the needs of VRA engineers to alleviate some of

the burdens, with regard to time spent on effective literature search and document delivery.

References

Ajayi, N.A. (2005) Information Seeking by Nurses in the Obafemi Awolowo University Teaching Hospital, Nigeria. *Information Development*, 21 (2)

Allen, T.J. and Cohen, S.I. (1969) Information Flows in Research and Development Laboratories, *Administrative Science Quarterly*, 4: 4-19.

Allen, T. (1977) *Managing the Flow of Technology*, Cambridge: The MIT Press.

Anthony, L.J. et al (1986) *Information Sources in Engineering*, 2nd ed. - London: Butterworth. pp. 1-36.

Chin-Chih, Chen and Hernon, P. (1982) *Information Seeking*. New York: Neal Schumann Publishers Inc, p.15.

Ellis, K. M. E. (2000) *Final Report on the Establishment of Technical Libraries in the Volta River Authority.* January 2000.

Ghana-Vision 2020 (The First Step: 1996-2000) (1995). Presidential Report to Parliament on Coordinated Programme of Economic and Social Development. – Accra: Government of Ghana, .45 p.

Ghanaian Times Newspaper(2005) Thursday, 10th February.

Hirsh, S. G. (2000) Information Needs and Information-Seeking and Communication in an Industrial R&D Environment. *Proceedings of the 63rd American Society of Information Science Annual Meeting. Vol. 37.* pp. 478.

iConnect Ghana (2003) An Information Society for Ghana – ICTs for Development. *The GINKS Newsletter, .2:* 1 - 6.

Kwasitsu L. (2003) Information-Seeking Behaviour of Design, Processing and Manufacturing Engineers. *Library and Information Science Research 25:* 459-465.

Leckie, G.J. et al. (1996) Modelling the Information Seeking of Professionals: A General Model Derived from Research on Engineers, Health Care Professionals and Lawyers. *The Library Quarterly* 66:167.

Ocholla, D.N. (1996) Information-Seeking Behaviour of Academics: A Preliminary Study. *International Information and Library Review,* 28:345-358.

Pinelli, T. E. (1991) The Information-Seeking Habits and Practices of Engineers. *Science and Technology Libraries, 11(3)* 5-25.

Pinelli T. E. (1991) *The Information-Seeking Habits and Practices of Engineers.* Hampton, The Haworth Press, pp.12-22.

Shina, S. G. (1991) *Concurrent Engineering and Design for Manufacture of Electronic Products.* New York, New York: Van Nostrand Reinhold, p.1.

Wilson, T. D. et al. (1979) Information Needs in Local Authority Social Services Department: A Second Report on Project INISS, *Journal of Documentation, 32 (2)*127.

Wolek, F.W. (1969) The Engineer: His Work and Needs for Information. *Proceedings of the 32nd Annual Meeting of the American Society for Information Science.* pp. 471- 476.

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Factors Influencing Information-Seeking Strategies and Sources Used by Oil Palm Scientists in Nigeria

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Abstract

This study investigated the influence of educational qualifications and tasks performed on the sources of information used by Oil Palm Scientists in Nigeria.The awareness of library tools and strategies employed in locating primary information was also surveyed. Scientists from the Nigerian Institute for Oil Palm Research (NIFOR), universities and oil palm industries across the country were grouped into three groups viz:PhD, M.Sc. and B.Sc. for this study. A questionnaire was used to gather data, and 95% usable response was obtained. Most of the respondents were men and the scientists used the library occasionally to obtain research-related information, especially when they have specific jobs at hand. The tasks performed by the three categories of scientists were research, teaching and administrative work. The scientists with PhD and M.Sc. used journals mostly, while those with B.Sc used textbook, indicating that educational qualifications influenced the information sources used by the three categories of scientists. The tasks the scientists performed also influenced the sources of information they used and awareness of the various information-seeking strategies influenced the use of such strategies.In order to improve access to information for the benefit of the scientists in the oil palm industry in Nigeria, Internet access is recommended.

Introduction

Nigeria was the foremost leader in world palm oil production and export, prior to 1965. Although she has relinquished this position to Malaysia, she still remains the largest producer in Africa and the third largest producer in the world, coming after Malaysia and Indonesia. The oil palm industry, as part of the overall agricultural sector, contributed significantly to the Nation's Gross Domestic Product (GDP) during the period before the emergence of crude petroleum oil, when agriculture was the engine of growth. With the emergence of crude petroleum oil, the contributions of agriculture and its oil palm sub-sector to government revenue and export earnings have declined to insignificant levels. Nevertheless, the oil palm sub-sector is still very important in Nigeria's development process (Omoti, 2001). In order to realise the current objectives of government in restoring oil palm to its lost glory in Nigeria, efforts have been put in place to strengthen research in this sector. Presently, there are 18 agricultural research institutes responsible for conducting agricultural research in Nigeria, among which is the Nigerian Institute for Oil Palm Research (NIFOR).

The Nigerian Institute for Oil Palm Research (NIFOR) was established in 1939. NIFOR has a central role to play in realising the objectives of government by conducting research into the problems and prospects of the oil palm industry in Nigeria. To fulfil the mandate of the Institute, the research scientists who are the line staff are primarily responsible to conduct research into the problems affecting its mandate crops. Apart from NIFOR scientists, supportive research on oil palm is still being conducted by scientists in some Nigerian universities, companies and colleges of agriculture across the country. In order to perform their job

very well, the scientists need information. To cater for the information needs of oil palm researchers, NIFOR established a library in 1939, with the mandate to collect, organise and disseminate information required for research. Presently, the library has over 10,000 volumes of journals, 8,000 volumes of books, 6000 volumes of research/annual reports, 600 volumes of thesis, 400 microforms, etc. The library is undergoing computerisation of its services and operation. Several databases have been designed and developed in the library. One of such databases is the Palms Science database. From this database, the library has been able to produce "Palms Science Abstracts", a bibliography and an index. Other services of the library include: Internet services, SDI services, Current Contents, Access to Global Online Research in Agriculture (AGORA), compilation of bibliographies and indexes, reading lists, routing of periodicals, literature search, photocopying services, accession lists production and notification of courses and conferences. The library is connected to the Internet through the Institute's V-SAT. These resources and services of the library made it an Oil Palm Information Centre (OPIC) in Nigeria, where scientists interested in oil palm research obtain relevant information. Over the years, scientists from all over the world have used this library for their research work concerning the oil palm.

Literature Review

In modern library practice, studies of information users are very important to enable the library provide adequate information and services to their clientele. To this end, the use of the library, information-seeking behaviour, strategies and sources used by various professional groups including agricultural scientists, are carried out. In Nigeria, several studies have been done to determine the information needs of scientists in the various disciplines. Adedigba (1985) studied the information needs and pattern of library usage by forestry researchers in Nigeria. He found out that they consulted two or more information sources, and they relied heavily on scientific literature. Olaniyan (1988) assessed the information needs of natural scientists, and posited that the natural scientists needed both manual and electronic information to carry out their various

functions. Ogunrombi and Oladokun (1993) investigated the sources of information used by agricultural extension workers in Ogbomosho area of Nigeria. They found out that the workers utilised various sources for the different tasks they perform, that the documentary sources used most were journal articles, agricultural extension literature and reports. Ochogwu (1993) identified books, newspapers and magazines as the most heavily consulted information sources used to meet the information needs of the various occupational groups such as students, scientists, technologists and engineers in urban and semi-urban communities in Borno State, Nigeria. However, within this same category of users, certain factors influence individuals within each sub-group in choosing their sources of information, such as source awareness, source availability and type of job. Adimorah (1977) reported that Nigerian soil scientists spent more time sourcing for information from their library, and their most preferred sources were journals, indexes, abstracts, citation index and bibliographies. Akinwunmi (1982) also reported that agricultural scientists depended on original research contained in agricultural journals, conference reports, symposia, review articles, books, manual and other primary literature, as well as abstracts, indexes and bibliographies. Russel (1983) identified conference and communication with colleagues as informal sources used by agricultural scientists in getting information in advance of formal publication. Ibeun (1995) reported the high preference for the use of journals for fisheries scientists in Nigeria. But Jimba (1999) and Jimba and Atinmo (2000) reported low usage of electronic sources among Nigerian agricultural scientists.

On the factors that may influence the information source used by scientists, Ibeun and Atinmo (1999) found that educational qualifications influence the sources of information used by Nigerian fisheries scientists. Igbeka and Atinmo (2001) reported significant differences in the information-seeking behaviour of Nigerian agricultural engineers, in relation to their work place, while Ingwerson (1992) found that information-seeking process depends on workers' tasks. Okoro and Okoro (2006) revealed that medical doctors in South-Eastern Nigeria mostly utilised journals, textbooks and conference materials as their information sources, and their years of experience

influenced their information utilisation significantly. Rolinson, Al-Shanbari and Meadows (1996) identified three main tasks of research, teaching and administration performed by agricultural researchers. These three tasks will be evaluated in this study.

However, the impact of educational qualifications, tasks performed and awareness of library services on the sources used by oil palm scientists in Nigeria are evaluated in the present study.

Objectives

User preferences for and frequency of use of information sources are as diverse as the different sources and disciplines, as well as categories of users. In order to determine how best to serve the needs of the various categories of oil palm scientists in Nigeria, this survey was carried out to achieve the following objectives: to

- find out the patterns of library use by the different categories of oil palm scientists;
- identify the different sources of information used by these categories of scientists;
- determine whether educational qualifications and tasks performed by the scientists have any influence on the sources of information they used; and
- establish the influence of the awareness of information seeking tools and strategies on sourcing for information.

It is hoped that this study would help the library in serving the scientists better by identifying the various characteristics of the scientists and their information-seeking strategies and needs, as well as to promote maximum use of the library resources and services by the scientists.

Methodology

Three categories of scientists from NIFOR, as well as from some Nigerian universities (Igbinedion University, Okada; Ambrose Alli University, Ekpoma; University of Benin, Benin City; Delta State University, Abraka; University of Uyo, Uyo; Ahmadu Bello University, Zaria; Federal University of Technology, Minna; University of Abuja, Abuja;

National Open University of Nigeria, Abuja; Kogi State University, Anyigba; University of Nigeria, Nsukka; Nnamdi Azikiwe University, Awka; Abia State University, Uturu; Enugu State University of Technology, Enugu; Madonna University, Okija; Obafemi Awolowo University, Ile-Ife; University of Ibadan, Ibadan; Babcock University, Ilishan, Remo and Covenant University, Otta) and other scientists from the Agricultural Development Programmes (ADPs); Ministry of Agriculture and Natural Resources (MANR), Michelin Farm, Shell Petroleum, Raw Material Research Development Council (RMRDC), University of Benin Teaching Hospital (UBTH) and Nigeria Institute of Policy and Strategic Studies (NIPSS), Kuru, who possessed a minimum educational qualification of B.Sc. and who used the library between January 2004 and October 2005, were involved in this study. One hundred and forty six (146) of such scientists used the library during the period, and they formed the population for this study. A questionnaire was used to gather data from the scientists on the spot, as they came in and used the library. Of the 146 scientists sampled, 138 responded. This put the response rate at 94%, and all the completed copies of the questionnaire were found usable as shown in table 1.

Table 1: Response Rate of Respondents

Categories of Users	No. of Users	Response	%
NIFOR Scientists	62	56	90
University Scientists	50	48	96
Scientists from other industries	34	34	100
Total	146	138	94

Results and Discussions

Background Information

Result of demographic study showed that there were more male 123 (89%) than female 15 (11%). The ratio of male to female respondents was 8:1, which is similar to Ibeun (2002) findings on demographic analysis of human resources in Nigerian fisheries and aquatic science that the ratio of male to female fisheries scientists in Nigeria was 8:1. Educational qualifications of respondents indicated that 30 (22%) had Ph. D. degree as their highest qualification, 48

(34%) had M.Sc. degrees, and 60 (44%) had B.Sc. degrees.

Table 2: Highest Educational Qualification of Respondents

Qualification	Freq.	%
PhD	30	22
M.Sc.	48	34
B.Sc.	60	44
Total	138	100

On the tasks the scientists performed, results revealed that all the three groups were engaged in three major tasks of research, teaching and administrative work. However, while all of them did research, only 61% were engaged in teaching and 48% performed administrative jobs, as shown in table 3. This means that the scientists performed more than one task at a time with more responsibilities for the PhD holders.

Table 3: Tasks Performed

Qualification of Users	Task performed Research	Task performed Teaching	Task Performed Administration
Ph.D.	30 (22%)	30 (22%)	27 (20%)
M.Sc.	48 (34%)	30 (22%)	24 (17%)
B.Sc.	60 (44%)	24(17%)	15 (11%)
Total	138 (100%)	84 (61%)	66 (48%)

Library Use

Fifty per cent of the PhD and the B.Sc. groups and 44% of the M.Sc. holders used the library occasionally (table 4). This result agreed with

Table 4: Frequency of Library Use

Users	Daily	Weekly	Monthly	Occasionally
Ph.D.	- (-%)	6 (20%)	9 (30%)	15 (50%)
M.Sc.	12 (25%)	9 (18%)	6 (3%)	21 (44%)
B.Sc.	12 (20%)	18 (30%)	- (-%)	30 (50%)

Awojobi's (2004) finding that 62.1% of Olabisi Onabanjo University lecturers were occasional library users. Ifidon (2004) confirmed that Nigerians have poor reading cultures and they used the library mostly for achievement reading. The above results of library use also show clearly that serious reading habit has not been formed, even among scientists.

Table 5 shows the respondents' rating of the library and its services. Results revealed that despite the low patronage of the library, its various services were rated adequate by 50% or more respondents. This means that the scientists were satisfied with the services offered by the library staff in obtaining one information or the other in meeting their information needs.

Results in table 6 revealed that 126 (91%) of the scientists indicated better funding of the library as the greatest solution towards solving the problems of the library to enable it provide improved access to information. Other solutions proffered were information sharing through library cooperation, Internet accessibility, provision of current contents, compilation of bibliographies and abstracts. Similar results by Awojobi (2004) stressed the need for increased funding to cope with modern day academic library responsibilities in providing Computer/ CD ROM and Internet services.

Table 5: Respondents' Rating of Library Services

S/N	Library Services	Number	%
1.	Library catalogues	126	91
2.	Literature searching	117	85
3.	Information services	110	80
4.	Library exhibition / display	110	80
5.	Reservation of documents	110	80
6.	Users education services	103	75
7.	Readers advisory services	99	72
8.	Current awareness services	96	70
9.	Referral services	96	70
10.	Inter-library cooperation	96	70
11.	Compilation of bibliography	93	67
12.	Compilation of reading list	90	65
13.	Photocopying services	83	60
14.	Circulation services	83	60
15.	Maintenance of special collections	83	60
16.	Abstracting and Indexing services	78	57
17.	Maintenance of vertical files	78	57
18.	Maintenance of clipping	76	55
19.	SDI services	69	50
20.	Translation services	69	50
21.	Routing of periodicals	69	50

N = 138

Table 6: Solutions Towards Improving Library and Information Access

S/N	Solutions	Freq.	%
1	Better funding of the library for better services	126	91
2	Inter-library cooperation for information sharing	90	65
3	The use of Internet to source for relevant information	78	57
4	Better dissemination of information by the library	54	39
5	Provision of directory, abstracts and bibliographies	45	33
6	Provision of current contents	40	29

N = 138

Influence of Educational Qualifications on Information Sources Used

To determine if educational qualifications influenced the information sources used by the scientists, twenty-one information sources were ranked according to the highest educational qualification obtained by respondents. Result revealed that journals ranked highest for the PhD (94%) and M.Sc. holders (90%), while it ranked third for the B.Sc. holders (83%). Textbooks and the Internet ranked first (85%) and second for the B.Sc group (84%), while the use of conference proceedings ranked fifth for all (PhD 72%, M.Sc. 80%, B.SC. 69%) groups. Other sources exhibiting high ranking among the PhD and M.Sc. holders are textbooks, research reports, annual reports and Internet. Therefore, the three categories of scientists exhibited varying preferences for the different sources of information. This result agreed with earlier works by Akinwunmi

(1982), Rolinson et al. (1996) and Alemna et al. (2000) that agricultural scientists depend greatly on scientific journals. The variation in the ranking order in the different groups (PhD, M.Sc. and B.Sc.) could be attributed to the factor of educational qualification. The above finding therefore showed that education qualifications influenced information sources used by the three categories of oil palm scientists in Nigeria. This result conforms to similar findings by Ibeun and Atinmo (1999) that educational qualifications influenced information use by fisheries researchers in Nigeria. The simple reason for this is that most university libraries restrict the use of journals to postgraduate students only, while the undergraduates are denied access, thus making them to use textbooks more than other groups. When these young graduates are employed, they carry over this attitude to their new profession. They gradually discard this attitude as they grow in the profession. Also, the obsoleteness of library collections is diverting attention towards the use of Internet, which occupies the second position among the B.Sc. group and fifth, overall ranking. This result confirms the work of Ekpenyong

(2001) that the use of Internet will help to solve the problem of obsolete resources in agricultural research libraries in Nigeria. Mabawonku (2002) and Yusuf (1997) have advocated the use of the Internet by librarians and scholars to get current research information.

Influence of Tasks Performed on Information Sources Used

The ranking of 21 information sources used to perform various tasks in table 7 reveals that different sources were needed to perform different tasks by the three categories of scientists. Journals ranked highest for carrying out research, textbooks for teaching, and discussion with colleagues for administrative jobs. This result conforms to Ingwerson (1992) that information-seeking process depends on workers' task. While it has been proved that journal is needed for research, the high prevalence of textbooks among the university communities i.e. teachers and students, and the broad topics covered by textbooks may have accounted for the use of textbooks for teaching. The use of

Table7: Ranking of Information Sources used in Performing Various Tasks

Ranking of Sources	Research	Teaching	Administration
1.	Journal	Textbooks	Discussion
2.	Research report	Research report	Research report
3.	Textbooks	Journal	Personal file
4.	Internet	Seminar papers	Annual report
5.	Annual report	Annual report	Personal correspondence
6.	Conference papers	Conference papers	Newspaper
7.	Discussion	Handbooks	Prof. Asso. Meeting
8.	Seminar papers	Field trips	Govt. publications
9.	Thesis	Prof. Asso. Meeting	Dictionary/Ency.
10.	Prof. Asso. Meeting	Internet	Handbooks
11.	Field trips	Discussion	Seminar papers
12.	Per. Sub. Journal	Newspapers	Journal
13.	Personal correspondence	Thesis	Conference papers
14.	Newspapers	Personal file	Textbooks
15.	Dictionary/Ency.	Dictionary/Ency.	Internet
16.	Personal file	Personal correspondence	Field trips
17.	Handbooks	Personal subscription of journals	Thesis
18.	Govt. publications	Govt, publication	CD ROM
19.	CD ROM	CD ROM	Personal subscription of journals
20.	Standards	Standards	Standards
21.	Microforms	Microforms	Microforms

informal discussions with colleagues was highly used for administrative job by the respondents. Administrative work involves dealing with people on one-on- one basis. That may have favoured its use for that purpose. This finding is similar to that of Njongmeta and Ehikhamenor (1998) that health professionals in Cameroon preferred informal sources of information to perform their jobs. The use of research reports is equally of great value in performing all tasks, as it ranked second on the table.

Information-Seeking Strategies

This entails how the scientists conduct searches for information scattered in diverse forms and formats. While some conduct literature search themselves, others depend on the library and their colleagues for information. In Cameroon, Njonmeta and Ehikhiamenor (1998) reported that health professionals there made use of several strategies to obtain the information they needed Respondents were asked to indicate which strategy they used mostly in seeking information. Results in table 8 indicate that most oil palm scientists conduct literature search by themselves (46%). The next strategy commonly used is by going to the library for assistance (30%), and thirdly by invisible college (17%).

Table 8: Information-Seeking Strategies

Strategies	Frequency	%
Self	63	46
Library Staff	42	30
Colleagues	23	17
Others	10	7
Total	138	100

The above result confirmed Adimorah (1993) findings that most scientists in Nigeria conduct their literature search themselves, while Edem (1993) indicated that most research journalists in Nigeria depend on the assistance of the library staff in locating their information. Onifade (2006) reported the use of library catalogues, information from colleagues and library staff as the most popular source in locating information from the special collection in the South-Western university libraries in Nigeria.

Awareness of Strategies Used in Sourcing for Information

In order for library users to locate primary literature for research, some tools and services are used. Six of such tools or services are: the library catalogue, abstracts and indexes, bibliographies and catalogues, SDI, current contents, and AGORA. The findings reveal that the library catalogue was the most used by oil palm scientists (98%); other strategies employed in locating relevant information to perform their tasks were bibliographies (93%), and abstracts and indexes (85%). The results in table 9 also show that 55% used the AGORA web site on the Internet.

The above results agree with the findings of Ibeun and Atinmo (1999) on abstracts, and Edem (1993) who reported the use of subject/author/title catalogues and other bibliographic tools to search for information materials.

Finally, 50% and 48% of the respondents claimed they were not aware of selective dissemination of information (SDI) and Current Contents services being offered by the library, and thus they did not use them. The implication of this result is that these services were not well projected by the library to enable its clientele be aware of them to encourage their use. Therefore, user education should be undertaken by the library to sell these services. Okoro and Okoro (2006) also recommended the use of user education to draw

Table 9: Awareness of Strategies Used to Source for Information

S/N	Strategies used	Aware/use	%
1.	Library catalogue	135	98
2.	Bibliographies / Catalogues	129	93
3.	Abstracting and Indexing services	117	85
4.	AGORA	76	55
5.	Current contents	72	52
6.	SDI Services	69	50

N = 138

attention to fact-finding tools that point to other valuable information sources

Conclusion and Recommendations

Demographic data on the oil palm scientists collected by the study show that the profession is dominated by men. The study also found that oil palm scientists in Nigeria used the library occasionally to obtain research information, especially when they have jobs at hand. They performed the tasks of research, teaching and administration, with all of them performing research. The information sources they used were diverse, and vary from one group to another. Educational qualifications influenced the information sources used by the scientists and the tasks performed by the scientists also influenced the sources of information they used. Therefore, educational qualifications and tasks performed are factors influencing information sources used by oil palm scientists in Nigeria. Awareness of information strategies also influenced their usage in sourcing for information. The scientists conduct literature search mostly by themselves. The library should take into consideration these factors in attending to the needs of the different user groups. Users' education for unpopular services such as SDI and Current Contents should be provided to create awareness for them, and encourage their usage. In order to meet the present and future information needs of scientists in the oil palm industry in Nigeria, adequate funds should be provided for the library to acquire current information materials and facilities to meet the challenges ahead. The library must aggressively enlighten the oil palm scientists on the use of tools available in the library for effective information retrieval.

References

Adedigba, Y.A. (1985) Forestry Researchers as Information Users in Nigeria. *Information Development*, 4: 229 – 232.

Adimorah, E.N.O. (1977) Information Needs and Information Transfer of Nigerian Soil Scientists. Unpublished Masters Thesis. Department of Library, Archival and Information Studies, University of Ibadan, Ibadan.

Adimorah, E.N.O. (1993) Information Needs of Scientists and Technologists in Nigeria. *Leading Library and Information Centres*, I (2) 9 – 26.

Akinwunmi, R.K. (1982) The Biblio-Attitudinal Demand of the Nigerian Agricultural Scientists from his Librarian. *Nigerbiblios*, 7 (2) 40 – 52.

Alemna, A.A.; Chifwepa, V. and Rosenberg, D. (2000) African Journals: An Evaluation of their Use in African Universities. *African Journal of Library Archives and Information Science*, 10 (2) 93 – 111.

Awojobi, E.A. (2004) Determinant of Library Use by Lecturers in the Faculty of Science and College of Agricultural Sciences, Olabisi Onabanjo University, Ago Iwoye, Nigeria. *Nigerian Libraries*, 38(1) 34 – 43.

Edem, U.S. (1993) Information Needs and Information Seeking Behaviour and Pattern of Journalists in Nigeria. *African Journal of Library Archives and Information Science*, 3 (2)167 – 174.

Ekpenyong, G.D. (2001) Agricultural Research in Nigeria: The Role of Institutional Libraries. *Information Development*, 17 (2) 118 – 122.

Ibeun, .M.O. (1995) Meeting the Information Need of Scientists and Policy Makers in the Fisheries Industry. Unpublished Ph.D Thesis. Department of Library, Archival and Information Studies, University of Ibadan, Ibadan.

Ibeun, M.O. (2002) Demographic Analysis of Human Resources in Nigerian Fisheries and Aquatic Sciences. *Journal of Aquatic Science*, 17 (1) 63 – 65.

Ibeun, M.O. And Atinmo, M.I. (1999) Relevance of Educational Qualification to Information Seeking Behaviour, Strategies and Sources Used by Nigerian Fisheries Scientists. *IAALD Quarterly Bulletin*, 44 (3/4) 184 – 190.

Ifidon, S.E. (2004) Reading Makes the Total Man. A Lead Paper Delivered at the South/South on the National Library's Readership Promotion Campaign Held in Port Harcourt on 20th April.

Igbeka, J.U. and Atinmo, M.I. (2001) The Influence of Work Place on the Information Seeking Behaviour and Information Utilisation of Nigerian Agricultural Engineers. *Nigerian Libraries*, 35 (1)1 – 14.

Ingwerson, P. (1992) A Cognitive View of Three Selected on Line Search Facilities. *On-Line Review*, 46 (5) 54 – 92.

Jimba, S.W. (1995) Accessibility to Information Technology, their Value and User Attitudes Among Scientists Using Agricultural Libraries in Nigeria. Unpublished Ph.D Thesis. Department of Library, Archival and Information Studies, University of Ibadan, Ibadan.

Jimba, S.W. and Atinmo, M.I. (2000) The Influence of Information Technology Access on Agricultural Research in Nigeria. *Internet Research: Electronic Networking Application and Policy,* 10 (1) 63 – 71.

Mabawonku, I. (2002). Literature Review. In: Handbook of the Training Course on Research Writing Skills for Library, Archives And Information Science Authors. pp. 10 - 13.

Njongmeta, L.N. and Ehikhiamenor, F.A. (1998) Health Information Needs and Services in Cameroon. *African Journal of Library Archives and Information Science*, 8 (1): 13 – 22.

Ochogwu, M.G. (1993) Information Needs and Resources Utilisation in Selected Urban and Semi Urban Communities in Borno State, Nigeria. *Leading Libraries and Information Centres*, 1 (1) 27 – 36.

Ogunrombi, S.A. and Oladokun, S.O. (1993) Sources of Information Used by Agricultural Extension Workers, Ogbomosho Area of Oyo State, Nigeria. *Leading Library and Information Centres*, 1 (1): 11 – 18.

Okoro, C.C. and Okoro, I.O. (2006). The Influence of Age and Experience on Information Seeking and Utilisation Behaviour of Doctors in South-Eastern Nigeria. *Gateway Library Journal*, 9 (1) 1 – 11.

Olaniyan, C.I.O. (1988) Information Needs and Users Demand in the Natural Sciences. *Paper Presented at the International Conference on National Bibliographic Centre for Science and Technology*. Bauchi, Nigeria 14th – 20th Feb.

Omoti, U. (2001) The Oil Palm Industry in Nigeria: Problems and Prospects. *Paper Presented as Special Guest of Honour at the Formal Inauguration of Oil Palm Growers Association of Nigeria*. Owerri, Imo State, 25th April, 2001.

Onifade, F.K. (2006) Awareness and Use of Special Collection in Some South-Western Universities Libraries in Nigeria. *Gateway Library Journal*, 9 (1) 42 – 50.

Rolinson, J.; Al-Shanbari, H. and Meadows, A.J. (1996) Information Usage by Biological Researchers. *Journal of Information Science,* 22 (1) 47 – 53.

Russel, H.M. (1983) Agricultural Users Population and their Information Needs in the Industrialized World. *IAALD Quarterly Bulletin*, 28 (2) 40 – 52.

Yusuf, M.A. (1997) Modern Information Technology and Library Services in Nigeria. *Kontagora Journal of Science and Technology*, 1 (2) 95 - 100.

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Records and Archives Legislation in Kenya and Management of Public Sector Records: A SWOT Analysis Approach

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Abstract

A strengths, weaknesses, opportunities and threats (SWOT) analysis of Kenya's Public Archives and Documentation Service Act Cap 19 was done to investigate the extent to which it facilitated the management of public sector records in Kenya. Data collection took place in 2005 through interviews and content analysis of the Public Archives Act. The research findings revealed that the Act had strengths, weaknesses, opportunities, as well as threats in relation to the management of public sector records in Kenya. The study concluded that Cap 19 did not effectively facilitate the management of public records, and it required some revision. It recommended that Cap 19 be reviewed to ensure that the responsibility for record keeping is shared between government agencies and the Kenya National Archives and Documentation Service (KNADS).

Introduction and Study Rationale

Records and archives legislation exists in many countries, in the form of a National Archives Act, or related rules and regulations in force. Shepherd and Yeo (2003) posited that records and archives legislation influences the development of a records management system, and would impose explicit requirements for the creation and management of records. Roper (1999) stressed that the enactment and application of comprehensive, up-to-date records and archives legislation is a critical pre-requisite for the establishment of an effective, integrated system for managing records and archives throughout their life-cycle.

The Association of Commonwealth Archivists and Records Managers (ACARM) Chairman's report s(2002) and (2004) announced that the organisation had initiated a project to study existing public records and national archival legislation in Commonwealth countries, together with legislations which had an impact on records and archives. Ketelaar (1985) pointed out that UNESCO's assistance to member states in the development of infrastructure for archives and records management included advice on archives and records management legislation. Regional seminars have been organised by UNESCO and the ICA to increase awareness of the importance of archival legislation among archivists.

According to a report by the Chair of the ICA Committee on Archival Legislation (McDonald, 1997), archival legislation should cover records management and direct national archives to develop standards and regulations for the management of current records held by other departments and agencies of public administration. Archival legislation should also define the respective roles of national archives and the various government departments for the appraisal and destruction of records.

A report prepared for UNESCO and the ICA by Millar (2004) observed that in many developing countries, archives legislation regulated the management of "archival" records identified as non-

current and historical. Often, the legislation did not allow the national archives to participate in the care of current records or in the development of record keeping systems. The recommendations offered by Millar's (2004) report for consideration by UNESCO and the ICA included that the ICA should continue its work to consolidate guidelines and tools on legislation and policies, including concrete and practical examples from professional practice, along with sample laws, policies, and related resources. Ngulube and Tafor (2006) pointed out that legislation that mandated archival institutions to manage records through their life-cycle in the East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) region was not comprehensive in certain instances. The existence of weak archival legislation was not confined to the ESARBICA region, as the ICA identified weak and ambiguous laws as one of the challenges facing archival institutions worldwide.

Existing records and archives legislation in Kenya is modelled on the British archives and records legislation. The responsibility of managing public records and archives in the Kenyan Public Service is vested in KNADS, as stipulated in the Public Archives and Documentation Service Act Cap 19 of the laws of Kenya (1965). The Act became effective on 25 January 1966. The Public Archives and Documentation Service Act Cap 19 comprises 15 sections namely:

-    Section1:   Title;
-    Section 2: Interpretation;
-    Section 3: Establishment of the public archives service;
-    Section 4: Powers of the Director;
-    Section 5: Directors powers in respect of public records;
-    Section 6: Public access to public archives;
-    Section 7: Destruction of public archives;
-    Section 8: Offences;
-    Section 9: Export of historical records;
-    Section 10: Legal validity of public archives;
-    Section 11: Certified copies of public archives admissible as evidence;
-    Section 12: Official seal of service;
-    Section 13: Copyright;

-    Section 14: Public archives advisory council; and
-    Section 15: Regulations.

The powers of the Director, KNADS, in respect of the management of public archives are spelt out in section 4 (1) a and b, which states that, the Director or any officer of the service authorised by the Director, shall have power to examine any public records, and advise on their care, preservation, custody and control. Furthermore, the Director may transfer into his custody any public record which he/ she considers should be housed in the national archives. The rest of the provisions, under section 4 (1) a, indicate the responsibilities of KNADS, with regard to the management of archives. The Public Archives (Amendment Act) No. 2 (1990), amended Cap 19 in 1990 and the main issues addressed by the amendment were: the head of the service was re-designated from Chief Archivist to Director, and a new section was created known as the National Documentation Service (NDS).

Owing to the current record keeping situation in Kenya, records and archives practitioners, educators and trainers are calling for a further review of the existing archives and records legislation so as to give record creators more responsibilities for managing their records, as opposed to the current situation, where the burden of managing public records rests with KNADS. Other researchers such as Tafor (2001), Garaba (2005) and Ngulube and Tafor (2006) established that most archival legislations in the ESARBICA region were outdated, and they require some revision.

Previous research in Kenya established that the Public Archives and Documentation Service Act Cap 19 had certain weaknesses, and called for its revision. However, the studies did not subject Cap 19 to a strengths, weaknesses, opportunities and threats (SWOT) analysis. For example, Ombati (1996) stressed that the Public Archives and Documentation Service Act was outdated and required revision. Githaka (1996) identified the enforcement by KNADS of existing archives legislation and regulations as one of the constraints that affected the development of effective records management practices in Kenya. Kemoni (1998) established that Cap 19 had certain weaknesses, which affected the management of records in the public sector. For

example, it was also not mandatory for record-creating agencies to play a role in managing records created within their own organisations.

In view of the foregoing, the present study adopted a different approach by subjecting the Public Archives and Documentation Service Act Cap 19 to a SWOT analysis, in order to establish the extent to which it facilitated the management of public sector records in Kenya. The research questions that guided the study were:

- What are the strengths of existing archives legislation in Kenya?
- What are the weaknesses of existing archives legislation in Kenya?
- What are the opportunities provided by Cap 19 in relation to the management of public sector records in Kenya?
- What are the threats lent by Cap 19 in relation to the management of public sector records in Kenya?
- Does Cap 19 effectively facilitate the management of public sector records in Kenya?

Significance of the Study

The current study is significant in various ways. The study findings are significant, as they are based on empirical research and would provide useful comparative data. The findings would be of use to record and archives management scholars, educators, consultants, researchers and students in Africa undertaking studies related to role of archival legislation in the management of public sector records.

The study supplements previous empirical research within the ESARBICA region, on aspects of archival legislation and their impact on managing public sector records. Such studies include those by Mnjama (1994), Wamukoya (1996), Tafor (2001), Ngulube (2003) and Garaba (2005). Unlike the previous studies which focussed on the weaknesses of archival legislation, the current study went a step further and used a SWOT analysis approach. It thus investigated other aspects of archival legislation such as its strengths, opportunities and threats, in relation to the management of public sector records in Kenya. It is therefore hoped that future researchers in the ESARBICA region and Africa in general consider using SWOT analysis model in investigating archival legislation in the other countries of the region.

The findings of the present study could offer valuable lessons to other archival institutions in Africa. The study would also contribute literature and data to the field of records and archives management, and make some contributions towards records management theory, practice, methodology and policy formulation.

Scope and Delimitations of the Study

The focus of the study was to establish the extent to which archival legislation facilitated management of public sector records in Kenya. The SWOT analysis of Cap 19 was confined to those sections of the Act that impacted on records management in the public sector, namely: Section 1 (title), Section 4 (powers of the director), Section 5 (director's powers in respect of public records), Section 7 (destruction of public records) and Section 8 (offences). The other sections of the Act were not considered relevant, as they deal with archives administration related functions.

The Kenya National Archives and Documentation Service has various cadres of professional staff working in the records management and archives administration divisions. Only archives personnel from Nairobi Records Centre and KNADS Headquarters who were directly involved with formulating records management policy or conducting field surveys and appraisal visits to government ministries within Nairobi Province were involved in the study. They were deemed suitable to provide answers that addressed the study objectives, as they were involved in field survey and appraisal visits. Archives personnel involved with archives administration activities were not involved in the study.

Literature Review

Archives Legislation

The enactment and application of comprehensive, up-to-date records and archives legislation is a critical pre-requisite for the establishment of an effective, integrated system for managing records and archives throughout their life-cycle (Roper 1999:3). The author noted that the precise form that

legislation takes will be constrained by that country's formal constitution and constitutional conventions, general political, economic, social, cultural and administrative environments, by existing records and archives legislation, and by the general level of records and archival development.

Archival legislation serves various purposes. According to Archives New Zealand (2007), the objectives of the Public Records Act which came into force on 21 April 2005 include: promoting accountability among the crown, the public and the government agencies; enhancing public confidence in the integrity of public records; enhancing and promoting historical and cultural heritage and encouraging partnership and goodwill, envisaged by the treaty of Waitangi, in relation to public records. National Archives of South Africa Act (1996) seeks to provide for national archives the proper management and care of the records of government bodies, and the preservation and use of a national archival heritage; and to provide for matters connected therewith.

Archives legislation models have been developed such as Ketelaar's (1985) Model Archives Law, the ICA Archives Legislation Model by McDonald (1997), Roper's (1999) Model Records And Archives Law, and the Williams and Roper (1999) Model Records And Archives Law. Ketelaar's (1985) Model Archives Law provided a summary of the main subjects, which needed to be considered for inclusion in archival legislation and regulations. He pointed out that the demarcation between law and regulations depends to a great extent on the legal tradition and administrative practices in a particular country. The essential elements of Ketelaar's (1985) archives law include definition of records and archives, inalienability and imprescribility of public archives, non-public archives, functions and organisation of public archives services, and national archives system. Other elements include: ministerial responsibility, advisory body (archives council), records management, preservation, arrangement and description, access, reprography, personnel and enforcement of the law.

A study by Roper and Williams (1999:43), on behalf of the International Records Management Trust, pointed out that a model records and archives legislation needed to have the following components:

- Titles;
- Definitions;
- Ministerial responsibility;
- Records and archives administration;
- An advisory body;
- Relative responsibilities of heads of agencies and the head of the National Records and Archives Administration for current and semi-current records;
- The duties of the head of the National Records and Archives Institution, in respect of archives;
- Access;
- Legal validity;
- Copyright;
- Statutory deposit;
- Private archives;
- Financial arrangements; and
- Penalties.

Schwirtlich (1999) quoting Hurley (1994; 1998) proposed an analytical framework for considering archival legislation and categorised archival legislation into the following: first generation archival legislation as legislation that establishes an archival authority; prohibits destruction without the archival authority's approval; empowers the authority to receive records withheld from destruction; and permits access to transferred records, unless restricted. Second generation archival legislation requires the transfer of records after a prescribed period; regulates records management activities; and establishes public rights of access to records after a specified lapse of time. Third generation archival legislation is distinguished by characteristics such as assuming that recordkeeping is the business of government rather than just the business of an archival authority, and outlines the outcomes of record keeping, and perhaps the principles for record keeping. Furthermore, third generation archival legislation does not require the existence of an archival authority in the way that first and second generation legislation do.

Concept of SWOT Analysis

It is often useful to evaluate a records management system by means of a SWOT (strengths, weaknesses, opportunities and threats) analysis. The purpose of a SWOT analysis is to reinforce strengths, remedy

weaknesses, take advantage of opportunities, and deflect threats as pointed out by Roper and Williams (1999). Churchill and Peter (1995) and Berkowitz, et al.(1997) opined that a SWOT analysis is the systematic evaluation of an organisation's strengths, weaknesses, opportunities and threats. Identifying the strength's, weaknesses, opportunities and threats helps the manager to find organisational strengths that match the environmental opportunities, preferably in areas where competitors do not have a similar match.

Businessballs (2007) citing Humphrey (2004) posited that a SWOT analysis came from the research conducted at Stanford Research Institute from 1960 to 1970. The background to SWOT stemmed from the need to find out why corporate planning failed. SWOT essentially tells us what is good and bad about a business or a particular proposition. If it is a business, and the aim is to improve it, then one needs to work on strengths (maintain, build and leverage), opportunities (prioritise and optimise), weaknesses (remedy or exit) and threats (counter).

AdCracker (2007) pointed out that SWOT analysis is a process to identify where one is strong and vulnerable and where one should defend and attack, and the result of the process is a plan of action. SWOT analysis gives a big picture of the most important factors that influence survival and prosperity, and can be performed on a product, service, company or individual.

Danca (2007), quoting Marketing Strategy (1998), stressed that SWOT analysis is a basic, straightforward model that provides direction, and serves as a basis for the development of marketing plans. It accomplishes this by assessing an organisation's strengths (what an organisation can do) and weaknesses (what an organisation cannot do), in addition to opportunities (potential favourable conditions for an organisation) and threats (potential unfavourable conditions for an organisation).

A scan of the internal and external environment is an important part of the strategic planning process, as pointed out by QuickMBA (1999). Environmental factors internal to the firm usually can be classified as strengths (S) or weaknesses (W), and those external to the firm can be classified as opportunities (O) or threats (T). To develop strategies that take into account the SWOT profile, a matrix of these

factors can be constructed. The SWOT matrix (also known as TOWS Matrix) is as shown below:

- S-O strategies pursue opportunities that are a good fit to the company's strengths;
- W-O strategies overcome weaknesses to pursue opportunities;
- S-T strategies identify ways that the firm can use its strengths to reduce its vulnerability to external threats; and
- W-T strategies establish a defensive plan to prevent the firm's weaknesses from making it highly susceptible to external threats.

By understanding the four aspects in the SWOT matrix, a firm can better leverage its strengths, correct its weaknesses, capitalise on golden opportunities, and deter potentially devastating threats (NetMBA 2002). When the analysis has been completed, a SWOT profile can be generated and used as the basis of goal setting, strategy formulation, and implementation. Marketing-teacher (2007) posits that SWOT analysis is a tool for auditing an organisation and its environment, and can be used in conjunction with other tools of analysis such as political, economic, social and technological (PEST) analysis and Porter's five-force analysis.

QuickMBA (1999) points out that a firm's strengths are its resources and capabilities that can be used as a basis for developing a competitive advantage. Examples of such strengths may include patents, strong brand names, a good reputation among customers, cost advantages and favourable access to distribution networks. Roper and Williams (1999) opine that weaknesses should be seen from the point of view of the organisation and that of its customers. Weaknesses should focus on what needs to be improved or is being done badly, or needs to be avoided or competitors are doing better.

Danca (2007) indicates that opportunities and threats relate to changes in the competitive, socio-cultural, political/legal environments and internal organisational environment. Mindtools (2007) stresses that useful opportunities can come from such things as changes in technology and markets on both a broad and narrow scale; changes in government policy related to one's field; changes in social patterns; population profiles and lifestyles; and local events. AdCracker (2007) states that threats relate to the obstacles faced; what competitors are doing

that may result in loss of clients; customers and market share; required specifications for job; products or services changing; cash-flow problems; and changing technology threatening positions.

Few studies have been reported in the literature that subjected archival legislation to a SWOT analysis, approach. A SWOT analysis of the situation in relation to public records in Scottish Executive Public Sector (2004), was conducted and revealed that the Freedom of Information Act and codes SIC and DP Act provided impetus for action by authorities. The weakness identified in the study was that existing public records legislation was inadequate; for example, it was too permissive, lacking clarity, out-of date and provided no sanctions.

Limitations and Misconceptions about the SWOT Model

The SWOT analysis model has limitations as noted by NetMBA (2002). While useful for reducing a large quantity of situational factors into a more manageable profile, the SWOT framework has a tendency to oversimplify the situation by classifying the firm's environmental factors into categories in which they may not always fit. The classification of some factors as strengths or weaknesses, or as opportunities or threats is somewhat arbitrary. For example, a particular company's culture can be either a strength or a weakness. Furthermore, a technological change can be either a threat or an opportunity. Consequently, what is more important than the superficial classification of these factors is the firm's awareness of them and its development of a strategic plan to use them to its advantage.

Koch (2000) noted that many complaints about SWOT performance seem to be based on misconceptions about its role. Some of these suggest poor analytical skills of some of those involved in strategic planning process, or their poor judgement. Other examples show inadequate amount of information about the company and its external environment. Still, other examples document poor quality of information relied upon in some SWOT analyses. It follows then, that it is rather the manager's misconceptions, misapplication of SWOT and less than diligent execution of strategic analysis than the inherent characteristics of the tool that ought

to be blamed for the prevalent industry perception that SWOT generated inputs are rarely sufficiently valid and reliable.

Methodology

The present study utilised interviews, complemented by a content analysis of the Public Archives and Documentation Service Act Cap 19 to establish the extent to which the existing legislation facilitated the management of public sector records in Kenya. The study's assumption was that archival legislation was key to the management of public sector records in Kenya. Adler and Adler (2003) pointed out that interviewing was the most widely used technique for conducting a systematic inquiry, for example, among sociologists, psychologists, anthropologists, psychiatrists, clinicians, administrators, politicians and pollsters. Silverman (1993) opined that interviews enabled a researcher to obtain data which was valid and reliable.

The target population of the study consisted of six archives personnel from the Nairobi Provincial Records Centre and KNADS Headquarters. The archives personnel involved in the study included the Assistant Director in charge of records management, provincial archivist in charge of Nairobi Records Centre, the deputy provincial archivist and three other senior archivists. As earlier stated, these respondents were deemed suitable to provide answers that addressed the study objective as they were involved in field survey and appraisal visits. Archives personnel involved with archives administration activities were not involved in the study.

Data were collected from archives personnel with the aid of a structured interview schedule. In the current study, the model records and archives law developed by William and Roper (1999) was used as a basis for constructing the interview schedule. The researchers borrowed other records management aspects that were covered in the interview schedule from The National Archives and Records Administration Act (USA). The questions asked were both open and closed-ended.

The pre-test of the instruments was conducted between February and April 2005. Thirteen respondents were asked to participate. They were drawn from Kenya, Botswana and South Africa.

Most respondents, that is, 12 (92%) out of 13, expressed their willingness to participate in the exercise, while 1 (8%) declined, citing pressure of work. Those who accepted to be involved in the pre-testing exercise included five archives personnel from the KNADS and five lecturers from Moi University, Kenya (that is, three from the School of Information Sciences and two from the Department of Sociology). Others were one senior lecturer from the Department of Information Studies, University of Botswana, and one archival scholar/expert from the South African History Archives at University of the Witwatersrand.

The qualitative data that were content analysed and presented in narrative form. Frequency distribution tables were also used.

Major Findings of the Study

The major findings of the study are presented under the following sub-sections in the same manner the research questions were phrased, namely: strengths, weaknesses, opportunities, threats, and whether or not Cap 19 facilitated the management of public sector records in Kenya.

Strengths of Cap 19

When asked if Cap 19, in its current form, stated the responsibilities of the Director of KNADS, all the six archives personnel responded affirmatively. They added that the responsibilities of the Director, KNADS, in relation to records management, were spelt out in Section 4 (1) a-b of Cap 19. Respondents were asked to indicate from a list of choices provided what constituted the responsibilities of the Director of KNADS, with regard to the management of public records. Their multiple responses are given in Table 1.

Table 1 shows that the least cited responsibility of the Director, with regard to the management of public records, was providing records management training, with a score of 4. One respondent among the four who cited provision of records management training as one of the responsibilities of the Director of KNADS pointed out that the responsibility was not explicitly stated in Cap 19, but implied. When respondents were asked to state if Cap 19 covered the management of paper and non-paper based records, five provided a "yes" response, while one recorded a "no" response. Those five who indicated that Cap 19 covered both the management of paper and non-paper records justified their response by citing section 2 of Cap 19, which states that:

> ...records include not only written records, but records conveying information by any means whatsoever...

All the six archives personnel noted that Cap 19 gave sufficient authority to the Director of KNADS to take custody of all public records. When asked if Cap 19 had undergone revision since its enactment, all the six archives personnel recorded a "yes" response. When asked to name the new clauses introduced when Cap 19 was revised in 1991, they cited the following: Head of Service re-designated from Chief Archivist to Director; title of Department changed from Kenya National Archives to Kenya National Archives and Documentation Service; and establishment of a National Documentation and Information Retrieval Service.

A content analysis of the Public Archives and Documentation Service Act Cap 19 confirmed that new clauses were introduced when the Act was revised in 1991. Section 3 of the Public Archives (Amendment) Bill, 1990, stated that Section 1 of the principal Act was amended by repealing Section 1 and inserting the following:

Table 1: Responsibilities of the Director of KNADS (N = 6)

Responsibility of the Director of KNADS	Number of Responses
Examine public records and advice on their care	6
Conduct record surveys and appraisals	6
Require the transfer to his/her custody, public records with archival value	6
Advise on preparation of record retention schedule	6
Advise on records disposal	6
Provide records management training	4

...this Act may be cited as the Public Archives and Documentation Service Act...

All the six archives personnel said that Cap 19 had strengths in relation to the management of public sector records. They cited the following as some of the Act's strengths: the Act empowers the Director to examine all public archives and advise on their care, preservation and custody, transfer valuable records to his/her custody; and authorise the destruction of valueless records to create space in government offices. They regarded the definition of public records in Cap 19 as adequate.

Weaknesses of Cap 19

When asked if Cap 19 in its current form stated the responsibilities of records creating agencies in managing their own records, all the six respondents provided a "no" response. When asked if Cap 19 stressed the continuity of records care during their entire life-cycle, four out of six archives staff gave a "no" response; one respondent answered in the affirmative, and the other one was not sure whether the Act stressed or did not stress the continuity of records care during their entire life-cycle.

When asked how Cap 19 stressed the continuity of records care during their entire life-cycle, the respondent who gave a "yes" response explained as follows: "the Act stresses constant consultation between archives and records creating agencies". Five out of the six archives personnel replied that the Act did not establish partnerships between record-creating agencies and the Director of KNADS, while the remaining respondent answered in the affirmative. In relation to the powers of the Director of KNADS, five felt that Cap 19 did not provide for sufficient penalties, with regard, to destruction or alteration of public records, while the remaining one respondent felt that Cap 19 provided sufficient penalties.

Four archives personnel answered that Cap 19 did not give the Director of KNADS authority to conduct research, with respect to the improvement of record keeping in the public service, while two responded in the affirmative. When asked if the Act gave the Director of KNADS authority to collect and disseminate information on technological developments relating to records management in public agencies, four gave a "no" response, while the remaining two responded in the affirmative. The two respondents who gave a "yes" response cited the application of computers in records management as an example of technological developments disseminated to public agencies. They cited microfilming as an example of technology they had advised government ministries to use, and they noted that KNADS had microfilmed the Ministry of Lands' title deeds.

Respondents stated that Cap 19 had weaknesses. The weaknesses of the legislation in relation to the management of public records were given as follows:

- "...it lacks the means or instruments to enforce the provisions contained there-in..."
- "...it only establishes the Office of the Director. He can only advise on records management and the Act does not specify who enforces the provisions of the Act in case of an offence..."
- "...It does not address private records/archives which would have implications on society..."
- "...lack of clear-cut responsibilities for creators of public records..."
- "...lenient penalties for those who contravene the provisions of the Act..."
- "...component of records management is not explicitly stated in the Act, it is only implied..."
- "...Director has no powers to prosecute..."

When asked if there were clauses archives personnel would like to be introduced into the current Public Archives and Documentation Service Act Cap 19, to enhance the management of public records, all the six gave the following as new clauses they would like to be introduced:

- Director's powers in respect to private records/ archives;
- Role of public offices in managing their records;
- Provision of adequate resources to implement the provisions of Cap 19; and
- Prosecution of offences relating to the destruction of public records.

Respondents were asked to indicate how the proposed new clauses would enhance the management of public sector records in Kenya. Respondents replied that the new clauses would reduce unauthorised destruction, mishandling and

mutilation of public records; public offices would embrace their responsibilities in respect to records management; and KNADS would be provided with adequate resources commensurate with its records management responsibilities in the public service.

Opportunities Provided by Cap 19

Archives personnel were asked to state if opportunities existed, which may be utilised by the Director of KNADS to enhance the management of public records, using the current Public Archives Act. Their multiple responses were as given in Table 2.

Table 3 shows that the least cited challenge faced by the Director of KNADS in using Cap 19 to manage public records was lack of a clear records management strategic direction, with a score of 2. The lack of support in retention and disposal schedule preparation and implementation as a major threat to using Cap 19 to manage records effectively was also mentioned by one respondent.

Cap 19 and the Management of Public Sector Records

Five archives personnel felt that Cap 19 had facilitated the management of public sector records,

Table 2: Opportunities to Enhance the Management of Public Records (N=6)

Opportunities that may be utilised	Number of Responses
Clamour for transparency and accountability in the public service	6
E-government strategy	6
New socio-political environment in Kenya	6
Fight against corruption in the public service	6
On-going public sector reform programmes	6
Clamour for freedom of information legislation	6
Existence of training institutions in records management	5

Table 2 shows that the least cited opportunity, which would be utilised by the Director of the KNADS to enhance the management of public records, was the existence of training institutions in records management, with a score of five.

Threats Lend by Cap 19

When asked if the Director of KNADS faced any particular threats or challenges in using the Public Archives and Documentation Service Act Cap 19 to manage public records, all the six gave a "yes" response. When probed to indicate the particular challenges they faced, their multiple responses were as given in Table 3.

while one respondent gave a "no" response. Those five who indicated that Cap 19 facilitated management of public sector records justified their responses by listing the following:

- Survey and appraisal visits had been facilitated in government ministries;
- Some ministries had prepared records retention and disposal schedules;
- Ministries had been sensitised on the need to manage records properly;
- The profile of records management had been raised in the public service; and
- Valuable records had been transferred to

Table 3: Challenges faced by the Director of KNADS when using Cap 19 to manage public records (N=6)

Challenges Faced	Number of Responses
Inadequate professional staff	6
Insufficient government funding	6
Staff lacking skills in IT	6
Lack of co-operation from senior government officers	6
Limited marketing of records management in the public service	6
No clear records management strategic direction	2

KNADS, while valueless ones had been destroyed.

The respondent who indicated that Cap 19 did not facilitate management of public sector records justified his/her response by stating that Cap 19 did not delegate clear records management responsibilities between record-creating agencies and KNADS.

Analysis and Interpretation of Results

It is only through interpretation that the researcher can expose relations and processes that underlie the findings, as stressed by Kothari (2004). Interpretation is a search for the broader meaning of the research findings. The data presented indicates that Cap 19 has strengths and weaknesses. It was also established that the Director of KNADS faced certain threats or challenges in using Cap 19 to manage public records, and this affected public service delivery.

An analysis of the Public Archives and Documentation Service Act Cap 19 showed that it lacked some of the requirements of records and archives legislation, as pointed out by Roper and Williams (1999). For example, the title did not stress the continuity of records care throughout the life of the record. The Act does not define all technical terms in the life-cycle of a record, such as current, semi-current and non-current records, retention and disposal. The Act does not separate the functions of the Director and those of the Minister responsible for archives, and the functions of the Director were rather limited, particularly concerning the management of electronic records.

Cap 19 did not also enumerate some of the responsibilities of the Director of a National Archives and Records Service, as pointed out by Roper and Williams (1999). These related to advising the heads of public offices on the number and grading of posts in the records class, and making appropriate postings and arranging the necessary training of members of the records class. The title of the Act does not capture all records management aspects, and does not stress the continuity of the care of records during their continuum. The finding is contrary to existing records and archives legislation in other countries, whose titles indicated the continuity of records care by capturing records

management and archives management aspects in their titles. Examples of such Acts include:
- The National Archives and Records Administration Act (America);
- The National Archives and Records Service Act (South Africa);
- The Public Records and Archives Department Law (Ghana); and
- The National Records and Archives Service Act (Botswana)

Cap 19 does not specify the responsibilities of record-creating agencies. This was contrary to existing records and archives legislation in other countries such as Australia and India, where the responsibilities of record-creating agencies were clearly spelt out in existing records and archives legislation. The National Archives of Australia (2004) stated that the responsibility for record keeping was shared between government agencies and the national archives. Section 5 (1) and (2) of The Public Records Act (1993) of India stipulated that every records-creating agency needed to nominate one of its officers as records officer, to discharge the functions of the Act.

Archives personnel pointed out that there were opportunities; which may be utilised by the Director of KNADS; to enhance the management of public records, for example, the clamour for transparency and accountability in the public service and on-going public sector reform programmes. This point was also articulated in the Office of the Vice-President and Ministry of Home Affairs Strategic Plan (2004-2008). One of the strategic perspectives of the department is to reposition the KNADS within the civil service for effective service delivery. The strategic initiatives include linking the on-going archives initiatives on records management to the Directorate of Personnel Management (DPM) - to their functions, harmonising the duties of records management officers to archives services and improving the visibility of the KNADS within the public service.

The findings of the current study concur with those of previous research in Africa that among other objectives, investigated archival legislation and its impact on managing public records. Tafor (2001) established that legislations governing archives and records management in most archival institutions

within the ESARBICA region were outdated. Garaba (2005) pointed out that the various pieces of legislation in existence in the ESARBICA region were archaic, and were in urgent need of review. In Ghana, Akotia (2003) noted that the revision of archival legislation assisted in enhancing records management practices in the Ghanaian public sector. A study by Mnjama (2005) showed that a survey of archival legislation in the ESARBICA region revealed that, except for Tanzania and Uganda which had enacted new legislation, most of the other national archives were still operating under archival legislation modelled along the UK model. The greatest weakness of these legislations was their failure to address electronic records and the role of advisory councils, which were ineffective. A recent study by Ngulube and Tafor (2006) established that legislation regulating archival activities in the ESARBICA region was outdated in four countries, that legislation did not adequately cover the records management function in seven countries, and that two countries did not have legal provision for an archival advisory board. The legislation of three countries did not define records in a comprehensive way, because the laws only covered record types that existed at the time the legislation was passed. Seven countries used 'first generation" legislation that gave the national archives a custodial role only without any clear involvement in the management of records during their life-cycle. Archival legislation in six countries in the ESARBICA region was "second generation", as the laws gave national archival institutions power to monitor and evaluate records management programmes from the time that records were created, until they were disposed of either through destruction or transfer to the national archives.

Conclusions and Recommendations

Through SWOT analysis, this study has revealed areas in which KNADS legislation could be strengthened. The study recommends that Cap 19 be reviewed to stipulate that the Director of KNADS be responsible for establishing and ensuring compliance with standards for the management of public records. The Act should be reviewed to ensure that the responsibility for record keeping is shared between government agencies and the National

Archives. Record-creating agencies would be legally required to appoint record management officers, who would be able to liaise with archives staff to enhance record keeping practices in their ministries. Barbat (1999) pointed out that this arrangement would be beneficial to record-creating agencies and the national archives.

The study recommends that Cap 19 be revised to ensure that the records management component is explicitly stated in the Act, unlike the current case where archives management is given more prominence in the title of the Act than records management. This would be in line with the practice in other countries such as Botswana, India, the United Kingdom, Australia, New Zealand, South Africa and United States of America.

The study identified opportunities which could be utilised by the Director of KNADS to enhance the profile management of public records, using the current Public Archives Act. It is also recommended that the Director of KNADS takes advantage of the opportunities to enhance the management of public records and make record keeping activities visible. These include the clamour for transparency and accountability in the public service, the fight against corruption and the on-going public sector reform programmes. This recommendation would ensure that efficient information and records management provides the basis for poverty reduction, accountability and effective management of state resources, protection of rights and entitlements, services to citizens, anti-corruption strategies and the rule of law, as noted by the IRMT (2005). Efficient information and records management practices would lead to improved public service delivery.

Suggestions for Further Research

It is recommended that studies be conducted in other African countries to investigate archival legislation, using a SWOT analysis approach. Such studies would supplement existing studies and provide a holistic and integrated approach in contextualising archival legislation, in relation to the management of public sector records. A SWOT approach would further provide a basis for understanding, revising and implementing archival legislation in Africa, in the light of existing socio-political, economic and information environments.

References

AdCracker. (2007). *SWOT. How to do a SWOT Analysis for Creative, Service and Professional Firms*. Available: http://www.adcracker.com/swot/index.htm (accessed 25 January 2007).

Adler, P. and Adler, P. (2003). The Reluctant Respondent. In: Holstein, J. and Gabrium, J. (eds.) *Inside Interviewing: New Lenses, New Concerns*. Thousands Oak, CA: Sage.

Akotia, P. (2003). Public Sector Records Systems in Ghana: Some Lessons in Development Management. *African Journal of Library, Archives and Information Science*, 13 (2): 107-117.

Archives New Zealand. (2007). *Public Records Act. Public Records Bill Passed*. Available: http://www.archives.gov.nz/publicrecordsact.php (accessed 25 January 2007).

Association of Commonwealth Archivists and Records Managers. (2002). *Chairman's Report 2001/2002*. Available: http://www.acarm.org/documents/cr2001-02.pdf (accessed 23 May 2006).

Association of Commonwealth Archivists and Records Managers. (2005). *Chairman's Report 2004/2005*. Available: http://www.acarm.org/documents/chair%20report%202005.pdf (accessed 23 May 2006).

Barbat, P. (1999). *Discovery of Records Management in France and its Consequences*. Paper Presented at the Archives and Records Management Seminar in Melbourne, Australia, August 2001. Available: http://www.caldeson.com/RIMOS/barbat.html (accessed 13 May 2006).

Berkowitz, E., R. Kevin, W. Hartley and W. Rudelius. (1997). *Marketing. 5th ed*. Boston: McGraw – Hill.

Businessballs. (2007). *The Origins of the SWOT Analysis Model*. Available: http://www.businessballs.com/swotanalysisfreetemplate htm (accessed 25 January 2007).

Churchill, G. and Peter, J. (1995). *Marketing: Creating Value for Customers*. Illinois: Austen Press.

Cooper, D. and Schindler, P. (1999). *Business Research Methods. 6th ed*. New Delhi: Tata McGraw-Hill Publishing Company.

Danca, A. (2007). *SWOT Analysis. What is SWOT Analysis?* Available: http://www.stfrancis.edu/ba/ghkickul/stuwebs/btopics/works/swot.htm (accessed 25 January 2007).

Dillman, D. A. (2000). *Mail and Internet Surveys. The Tailored Design Method*. 2nd ed. New York: John Wiley and Sons.

Garaba, F. (2005). An Investigation Into Archival Appraisal Practices in the Member States of the East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA). *M.I.S. Thesis*. Pietermaritzburg: Universal of KwaZulu-Natal.

Githaka, B. (1996). Constraints on the Development of Records Management in Kenyan Public Offices. *ESARBICA Journal*, 10: 7-16.

International Records Management Trust. (2005). *Information for Good Governance*. Available: http://www.irmt.org/ (accessed 9 June 2005).

Kemoni, H. (1998). The Impact of Record Centres on the Management of Public Sector Records in Kenya. *Records Management* Journal, 5 (1): 55-65.

Ketelaar, E. (1985). *Archival and Records Management Legislation and Regulations*. Available: http://www.unesco.org/webworld/ramp/html/ (accessed 23 May 2006).

Koch, A. (2000). *SWOT Does not Need to be Recalled: It Needs to be Enhanced. Part 1: Description of the Problem*. Available: http://www.westga.edu/~bquest/2000/swot1.html (accessed 28 January 2007).

Kothari, C. (2004). *Research Methodology: Methods and Techniques*. 2nd ed. New Delhi: New Age International (P) Limited.

Marketing teacher. (2007). *SWOT Analysis*. Available: http://www.marketingteacher.com/Lessons/lesson_swot.htm (accessed 25 January 2007).

McDonald, L. (1997). A Report of the ICA Committee on Archival Legal Matters: Principles for Archives and Current Records Legislation. *Janus*, 1: 110-116.

Millar, L. (2004). *Authenticity of Electronic Records: A Report Prepared for UNESCO and The International Council on Archives*. Available: http://www.ica.org/biblio/study13_2Erev.pdf (accessed 23 May 2006).

Mindtools. (2007). *SWOT Analysis. Discover New Opportunities. Manage and Eliminate Threats*. Available: http://www.mindtools.com/pages/article/newTMC_05.htm (Accessed 25 January 2007).

Mnjama, N. (1994). Railway Records: Their Management and Exploitation in Kenya. *Ph.D. Thesis*. London: University College London.

Mnjama, N. (2005). Archival Landscape in Eastern and Southern Africa. *Library Management*, 26 (8/9): 457-470. Available: http://www.emeraldinsight.com/(accessed 23 May 2006).

National Archives of Australia. (2004). *Commonwealth Record keeping - An Overview*. Available:http://www.naa.gov.au/recordkeeping/overview/new-approach.html (accessed 29 July 2004).

National Archives of South Africa Act, No. 43 (1996). President's Office. Available: http://www.info.gov.za/gazette/acts/1996/a43-96.htm (accessed 4 August 2006).

NetMBA. (2002). *Strategic Management. SWOT Analysis*. Available: http://www.netmba.com/strategy/swot/

Ngulube, P. (2003). Preservation and Access to Public Records and Archives in South Africa. *Ph.D. Thesis*. Pietermaritzburg: University of Natal.

Ngulube, P. and Tafor, V. (2006). An Overview of the Management of Public Records and Archives in the Member Countries of the East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA). *Journal of the Society of Archivists*, 27 (1) 57-83.

Office of the Vice-President and Ministry of Home Affairs. (2005). *Strategic Plan. Final Report 2004-2008 Volume 1*. Nairobi: Office of the Vice-President and Ministry of Home Affairs.

Ombati, K. (1996). *Adequacy/Inadequacy of the Public Archives and Documentation Service Act Cap 19*. Paper Presented during the KNADS Biennial Senior Staff Seminar, KNADS Headquarters, 19-23 August 1996.

The Public Archives and Documentation Service Act Cap 19 Laws of Kenya 1991 (Revised). Nairobi: Government Printer.

The Public Archives (Amendment Act) No. 2, 1990. Nairobi: Government Printer.

The Public Records Act, No. 69 of India. (1993). Available: http://www.nationalarchives.nic.in/public-record93.html (accessed 24 August 2005).

QuickMBA. (1999). *Strategic Management. SWOT analysis*. Available: http://www.quickmba.com/strategy/swot/ (accessed 25 January 2007).

Roper, M. (1999). *A Model Records and Archives law*. London: International Records Management Trust.

Roper, M. and Williams, T. (1999). *Strategic Planning for Records and Archives Services*. London: International Records Management Trust.

Schwirtlich, A. (1999). *Australian Society of Archivists 1999 conference. Overview of Archival Legislation in Australia*. Available: http://www.archivists.org.au/events/conf99/schwirtlich.html (accessed 25 January 2007).

Scottish Executive. (2004). *Public Sector. SWOT Analysis of Current Situation*. Available: http://www.scotland.gov.uk/Topics/Government/FOI/18593/13940 (accessed 25 January 2007).

Shepherd, E. and Yeo, G. (2003). *Managing Records: A Handbook of Principles and Practice*. London: Facet Publishing.

Silverman, D. (1993). *Interpreting Qualitative Data*. London: Sage Publications.

Tafor, V. (2001). The Management of Public Records in the Member Countries of the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA). *M.I.S. Thesis*. Pietermaritzburg: University of Natal.

Wamukoya, J. (1996). Records Management and Administrative Reform Programmes in Kenya. *Ph.D Thesis*. London: University College London.

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Use of Search Engines for Research by Postgraduate Students of the University of Ibadan, Nigeria

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Abstract

The study was motivated by the methodological requirements of a related study on the coverage of Africa-specific information by Internet search engines, and the need to promote understanding of the search engine experiences, preferences and training needs of postgraduate research students in an African university setting. The data were collected through a structured 25-item questionnaire administered to 327 postgraduate students in a population of 6525. Data were collected only from students who had been using search engines. They were resident in the hostels, and were available during the study. The questionnaire response rate was 75.9%. Google and Yahoo! were by far the most popular engines with the students in that order. Most of the students frequently used the two search engines together for browsing; and about 75% of them learned how to use search engines through friends or by trial and error. Students relied on search engines mostly for their academic work, and for job search. Although almost 90% of the students were at least 'somewhat confident' with their most preferred engines, only a third of them were aware of the advanced and Boolean search options provided by the engines, apart from experiencing problems with how to select words for searches. The findings of the study confirm the continuing need for educational planners and administrators in African universities to integrate adequate

information (technology) literacy content into the curricula for postgraduate and research students in the universities.

Introduction

Obenaus (1994) has characterised the Internet as a self-organising network of networks which, through the interconnectivity it provides between different computer platforms, has attracted the attention of a large number of users. The Internet also provides the infrastructure for the publication and distribution of different types of information and information services in various formats particularly through the World Wide Web (the Web), an interconnection of millions of web sites and web pages belonging to different organisations and providing different types of digital information contents and services. The rapid development of the Web in the 1990s supported a new array of documentary and pictorial communications, as well as a continuing stream of innovative applications in such areas as electronic publishing, multimedia, digital libraries, distance education, knowledge mining and electronic commerce (Kling, 1999). The Web is fast becoming the first point of call for more people in all countries for finding information, because it is now the single largest information market where the supply of information meets the demand.

The rapid growth of the Internet and the Web is characterised by both digital information revolution and explosion. The digital information revolution and explosion manifest in the *ever increasing quantities and array of new* electronic information resources provided by computer networks and the Internet, including web pages, newsgroups, mailing lists, electronic archives, networked databases, software applications and business services. There

is also a growing array of different Internet-based tools for finding, indexing, classifying and retrieving information on the Internet such as search engines and meta-search engines. Search engines and meta-search engines are Internet facilities to assist information seekers to find required information on the ever-growing Internet. A *search engine* is a set of computer programs that search for web pages on the Internet, index the pages in a database, and makes the database available for searching by information seekers through an appropriate user interface at its web site. *Meta-search engines* in turn provide user interfaces at their web sites for information seekers to search the databases of many search engines simultaneously.

Problem Statement

The concept of 'information literacy' is nowadays usually interpreted in terms of *"a set of competencies that an informed citizen of an information society ought to possess to participate intelligently and actively in that society"* (Shapiro and Hughes, 1996, p.1). The digital information revolution has implications for the 'information literacy' skills expected of citizens in general, and students, teachers and researchers in particular. Performing tasks in the home, at work, and in school and college is nowadays more challenging, because the growing alternative sources of information provided by the digital revolution makes a person's relative efficiency in performing the tasks compared to others to depend on his/her comparative abilities to exploit newer information sources constantly being provided by the revolution. Accordingly, among the critical competencies of information literacy in the digital age is, not surprisingly, the capability of individuals to use computer systems and the Internet to communicate, search for and apply information from different information sources to solve problems.

In most developed countries, the implementation of educational curricula to develop and improve computing and Internet search skills for problem solving in both teachers and students is already ingrained in school and college life, as confirmed for the United States by the Pew Internet & American Life Project (2002). The study found that US college students were heavier users of the Internet compared to the general population, partly because they have grown up with computers since their early childhood, and partly because the Internet is a part of the college student's daily routine.

By contrast, most developing countries are presently positioned opposite to the developed countries on the digital divide, in terms of the levels of development of information technology infrastructure, Internet access, and the possession by citizens of information literacy skills as defined above. The situation is however changing very fast, as confirmed by Jensen (1998), for many African countries. Starting from about the middle of the 1990s, African countries have been recording rapid growth in their information technology infrastructure, particularly telecommunications and Internet access. The telecommunications sector of Nigeria, for instance, ranked as one of the first few fastest growing globally between 2002 and 2005. There have also been rapid improvements in levels of access to computer systems and the Internet in tertiary educational institutions in specific African countries, as a result of the IT investment initiatives in many such institutions. Sani and Tiamiyu (2005) have observed, for instance, that automated information services (including Internet access services) in Nigerian federal universities began to accelerate as from the early 1990s, when the World Bank intervened with a loan to improve the institutional capacities of the Nigerian universities.

The growing amounts of investment that African tertiary education institutions have been committing to the development of information technology infrastructure mean that the institutions would be keenly interested in studies that investigate how the infrastructure is being used by their administrators, teachers, learners and students towards assessing the cost-benefit of their investments. Studies of the use of Internet facilities by students and teachers to support teaching, learning and research in specific African tertiary educational institutions are presently few, and in-depth studies of the use of specific Internet resources such as search engines are rare. Accordingly, this study was motivated by the desire to collect and analyse empirical information on the use of Internet resources by students of Nigerian universities, and specifically, the use of search engines by

postgraduate students of the University of Ibadan, Nigeria, for finding sources of Africa-specific information on the Internet.

Objectives of the Study

The main objective of this study was to investigate the Internet search engine usage behaviour and experiences of research students in an African and Nigerian setting, using the postgraduate students of the University of Ibadan as the focal population. This study was initially conceptualised as part of the methodology of a related study on the coverage by major Internet search engines of sources of Africa-specific information (Tiamiyu and Salako, 2007), hereafter referred to as the search engine study. The methodology of the search engine study required obtaining prior information on the search engines most preferred and used by information seekers in an African setting, as well as the subject topics on which the information seekers frequently searched for sources. This study was accordingly implemented to obtain the required information, using the postgraduate students of the University of Ibadan as the representative focal population. However, in order to derive maximum value from the study of the students, its data collection objectives were expanded to enable the analysis of data on other Internet searching-related experiences of the students beyond the variables required by the search engine study.

Accordingly, this study was designed to answer the following research questions:

- What is the extent of Internet use among the students?
- Which search engines do the students use or use in combination most often to search for information on the Internet, and why?
- For how long have the students been searching the Internet, and how did they acquire the Internet searching skills?
- How do the students use the special facilities provided by the search engines, and how confident are they in the use of such facilities?
- To what extent do the students search for Africa- and Nigeria-specific information using the search engines?
- For what subjects do the students use the search engines to search for?

Literature Review

The importance and wide ranging scope of the Internet for general communication, information retrieval and instructional delivery to support administrative, teaching/learning and research activities in tertiary educational institutions is acknowledged worldwide. The Internet is also acknowledged globally as a technology dominated by young people, and particularly students who, being more exposed to information technologies in educational systems, as well as being more willing to try new things than the older members of society, are more inclined to exploit Internet resources for education, social interaction and entertainment. This is clearly confirmed in the case of the US by the findings of the Pew Internet and American Life Project (2002) mentioned earlier. The study found that 86% of college students have gone online, compared with 59% of the general population; that 78% of college Internet users say that at one time or another they had gone online just to browse for fun, compared to 64% of all Internet users; that college Internet users are twice as likely to have ever downloaded music files; and that college students used the Internet nearly as much for social communication as they do for their education.

A number of studies have investigated how the Internet is used among academics and students at the tertiary levels of education for such activities as communication, information retrieval, learning, teaching and research. Some of the studies have focused on Internet use alone, whereas others have investigated Internet use in the context of the array of information sources, including the Internet that students and their teachers could use in their learning, teaching and research.

Applebee, et al. (2000) undertook a nationwide study of the use of Internet services by Australian academics and found that, contrary to expectations, email did not appear to have been used extensively by the academics to communicate among themselves, that as many as 25.7% had never used it to communicate with students, and that nearly a third reported that they were either non- or beginner-users of the Web.

In the UK, Armstrong, et al. (2001) surveyed 599 undergraduate and postgraduate students as part of a nationwide study of the use of different

electronic information systems (EIS) by students, academics and library staff of 25 universities in the UK, and found that students concentrated on only a limited array of electronic information systems, particularly web information systems, and that search strategies used by the students were mostly ad hoc. The three most regularly used systems for postgraduate students were search engines, email and OPACs; whereas for the undergraduates, the rank order were email, OPAC and search engines. The study also found that postgraduate students used the systems mostly for assignments (mentioned by 55% of the respondents), background research (54%), job search (35%), planning (29%) and presentation (22%), whereas the undergraduate students used the systems mostly for their thesis (23%), background research and projects (17%) and assignments (14%).

In the USA, a University of Texas (1997) study reported that 73% of the over 500 responding students used the Internet at least once a week on average; that the average amount of time spent online is eight hours per week; and that the favourite online services (with over 50% endorsement) are: e-mail, the World Wide Web, and the library. Among the responding students who used the Internet weekly, 37% frequented newsgroups, 9% chatted, and less than 2% played with multi-user dungeons. McFadden (1999) analysed the 2310 hits information resident in the cache of computers in a computer lab of a major US state university, and found that students' use of the computers to visit pornographic and gambling sites was very low, and that nearly half of Internet visits (47%) was accounted for by a 'general category' of sites (including sites apparently related to course activities, research, or personal interests such as anatomy, science, books, literature, airlines, government, health and disease, psychology, business statistics, etc). This was followed by visits to sites for mail (28%), chat (6%), search (6%), sports (6%), courses (4%), news (1%) sex (1%). Healy (2002) also highlights the findings of the Outsell/DLF Study of the US Academic Information Environment. The study compared how students and faculty in different institutions, disciplines and levels used information to support their research, teaching, and learning functions. The study found that the most common ways the respondents used to search for information was to use a search engine (48%) or the library's website (33%); that undergraduate students used search engines more than graduate students; that at least one-half of the students with undeclared majors (58%), or in the business (57%), physical sciences/mathematics (55%), engineering (52%), and arts and humanities (50%) used search engines; and that graduate students used the library website to get pointed to the right information sources more than either faculty or undergraduate students. Another US study, by Korgen et al. (2001), found that students' self-reported Internet use was highest for freshmen, followed by sophomores, seniors, and juniors, in that order.

In the context of developing countries, Aman (2004) investigated the patterns of usage of Malaysian academic library websites among 823 university students, and found that a majority of the respondents agreed that the Internet adds value to library services and speeds up reference searching. For 23 per cent of respondents however, the Internet was not their first choice in reference searching, although a majority of the respondents agreed that the Internet makes reference work more challenging, more fun, more interesting, and more accessible. Ojedokun (2001) investigated access to, and use of, the Internet by students at the University of Botswana. He found that students used the Internet more for email than for browsing, and that email was used more for communicating with fellow students, friends and relatives than with their lecturers.

In the Nigerian context, Ajuwon (2003) surveyed 183 first year medical and nursing students of the University College Hospital, Ibadan, Nigeria, during a library orientation programme, and found that (sic) 'slightly more than two thirds (60.7%)' of the students had used the Internet before the study, and that e-mail was the most popular Internet services (used by 76% of the students). Jagboro's (2003) survey of Internet usage by postgraduate students found that the students' use of the Internet ranked fourth (17.3%) among the sources used for obtaining research materials. Moreover, among the respondents who used the Internet, a higher proportion (70%) used it for e-mail, compared to for obtaining research materials (53%). Akporido (2005), in a questionnaire survey of 165 actual clients of cyber cafes in Abraka, the capital of Delta State, Nigeria, found that 81% of the respondents were students, and that the purpose mentioned most

frequently for Internet usage was email (100% of the respondents), followed by research (87%), search for specific information (60%), and to keep abreast of the latest news (53%). The Yahoo! search engine was the most popular search engine (100% of the respondents), followed by Google (68%).

Significantly, all the studies reviewed above, as well as most studies of their kinds, are usually implemented on the assumption that higher levels of Internet use is a desirable activity in that it is more likely to lead to increased productivity of work, learning, teaching and research. A few other studies have however investigated the potential negative relationship between hours spent by students using the Internet and their academic performances or psycho-social conditions. Korgen, et al. (2001) found significant correlation between students' self-reported study hours and Internet use hours. But the University of Texas (1997) found that 13% of the students who used the Internet weekly also reported significant symptoms of dependency on Internet use (similar to symptoms found in substance abuse and gambling), such as failure to fulfil other responsibilities, due to Internet use, continued use despite problems related to Internet use, lack of control over use, and withdrawal or tolerance symptoms.

Methodology

Population and Sample

One of the primary data collection objectives of the study, as explained above, was to collect information about search engine use among adequately motivated and Africa-based searchers of Internet sources of Africa-specific information. In order to determine the sub-population of such searchers to focus upon and sample from, the study made the following assumptions and inferences: (a) that search engine use would be required more in research-oriented than in less research-oriented work and learning activities; and consequently, (b) that postgraduate students (who are usually involved with research-oriented projects and courses of study) would be more motivated to use search engines for information searching on different subjects than their undergraduate counterparts in the same setting. These assumptions informed using the postgraduate students of a Nigerian university as the focal

population for the study, and specifically, the postgraduate students of the University of Ibadan, Nigeria, where the researchers were also based at the time of the study. The University of Ibadan is the oldest university in Nigeria, and offers academic and professional postgraduate programmes at the doctoral, master's, diploma and certificate levels through academic departments in the Faculties of Agriculture, Arts, Education, Science, Social Science, Technology, the College of Medicine, and some academic institutes and centres. The University also has the largest number of postgraduate students in the country.

The population of registered postgraduate students at the university at the time of study was 6265 (*Source: Data Processing Unit, Postgraduate School, University of Ibadan*), and a sample of 450 (i.e. about 7% postgraduate students was targeted as adequate for the study, based on such considerations as the size and characteristics of the focal population and the sample sizes of related studies of students in Nigeria and other developing countries.

Questionnaire Administration

Data for the analysis were collected through a highly structured 25-item questionnaire. Although the target population comprised all postgraduate students of the university, the actual sample of students for the study excluded all those who had not yet been using search engines on the Internet, and this was achieved during the questionnaire administration by determining first whether an approached student had been using any search engines. Actual sampling of respondents for the study was from the population of students resident in the three postgraduate halls of the university using a door-to-door approach, and excluding students who were either not available, or had not previously been using Internet search engines, or were unwilling to participate. These sample selection criteria were used to facilitate quick data collection. Eight postgraduate students assisted with the questionnaire administration over six weeks during April and May 2005. Ultimately, 431 copies of the questionnaire were actually distributed, out of which 327 were recovered, for a response rate of 75.8%, and an achieved sampling rate of 5.2%. Of the total number of respondents, 192 (58.7%) were

male and 129 (39.4%) were female (excluding respondents who did not indicate their gender), while most of the respondents (56.9%) had spent between six and twelve months on their postgraduate programmes.

Findings

Internet Experience

As explained earlier, the sampling of respondents ensured that all the respondents had been using Internet search engines prior to the study. Data on the duration of Internet use experience (Table 1) shows that 78.3% of the respondents had been using the Internet for more than 24 months, i.e., before commencing their postgraduate programmes.

Table 1: Duration of Experience in Internet Use

Duration of Experience	Frequency	Percent
Less than 6 months	10	3.1
6-12 months	18	5.5
12 – 24 months	28	8.6
More than 24 months	256	78.3
No response	15	4.6
Total Respondents	327	100

Mode of Acquisition of Search Engine Usage Skills

Respondents that had been using search engines were asked how they learnt to use search engines. Table 2 shows that 169 (51.7%) were taught by friends, 81(24.8%) of the respondents learnt to use search engines by trial and error, 37 (11.3%) were taught at a computer school, and only 6 (1.8%) read about it up in a book.

Table 2: Mode of Acquisition of Search Engine Skills

	Frequency	Percent
Taught by a friend	169	51.7
Trial and error	81	24.8
At a computer school	37	11.3
Read a book	6	1.8
No response	34	10.4
Total Respondents	327	100

Preferences for Search Engines

Respondents were given a list of major Internet search engines, and asked to choose which ones they preferred. Table 3 shows that Google was the most popular search engine (preferred by 67.3% of the respondents), followed by Yahoo! (20.8%).

Table 3: Preferences for Search Engines

	Frequency	Percent
Google	220	67.3
Yahoo!	68	22.9
AltaVista	3	0.9
Lycos	2	0.6
Ask Jeeves	2	0.6
MSN	1	0.3
Netscape	1	0.3
No response	30	9.2
Total Respondents	327	100

Respondents were also requested to choose from an offered list one or more reasons for preferring particular search engines. About a third (30.3%) chose *quality of items* as one of their reasons, 78 (23.9%) chose *user friendliness*, 35 (10.7%) chose *speed of access*, 64 (19.6%) chose *just out of habit*, and only 19 (5.8%) chose *quantity of items* (Table 4). It was of course not surprising that *quantity of items* was chosen by the fewest respondents, given that all search engines usually provide large numbers of hits, for even the most sophisticated queries.

Table 4: Reasons for Search Engine Preferences

	Frequency	Percent
Quality of items	99	30.3
User friendly	78	23.9
Just out of habit	64	19.6
Speed of access	35	10.7
Quantity of items	19	5.8
No response	32	9.8

(N=327)

Table 5 also shows that most of the respondents (42.8%) used two search engines (in most cases Google and Yahoo!) together on a regular basis, followed by the number of respondents who used

just one engine on a regular basis. This shows that respondents were either satisfied with Google and yahoo, or were not very knowledgeable of the diverse range of search engines available for searching the Internet. The cross-tabulation of the data on the variables *most preferred search engine* and *number of search engines used together regularly* (corresponding table not shown here) provided further insight that out of the 84 respondents that used just one search engine on a regular basis, 75 (89.3%) of them used Google. This suggests that Google is probably the entry-level search engine for most postgraduate students represented by the study's sample, which is complemented by Yahoo! as the students get more adventurous.

Table 5: Number of Search Engines Used Together on a Regular Basis

	Frequency	Percent
One	84	25.7
Two	140	42.8
Three	50	15.3
More than three	23	7.0
No response	30	9.2
Total respondents	327	100.0

Confidence and Proficiency in Using Search Engines

Most of the respondents believed that they felt confident in their abilities, when using search engines to find information online, with 47% and 42% indicating that they were 'very confident' or 'somewhat confident' respectively (Table 6).

Table 6: Confidence in the Use of Search Engines

	Frequency	Percent
Very confident	155	47.4
Somewhat confident	137	41.9
Not confident	9	2.8
No response	26	8.0
Total Respondents	327	100.0

This finding is not too surprising because, as reported above, most of the respondents reported having been using the search engines for more than a year. Nevertheless, most of the respondents, although 'confident' had not been using the advanced search facilities or sophisticated search queries on the search engines. Table 7 shows that only about 30% of the respondents had used the advanced search option of search engines before and an almost equal proportion (27.8%) had never heard of Boolean operators (Table 8), not to talk of using the operators in the advance search option.

Table 7: Use of the Advanced Search Options of Search Engines

	Frequency	Percent
Always	16	4.9
Often	73	22.3
Sometimes	101	30.9
Rarely	37	11.3
Never	23	7.0
Never heard of it	42	12.8
No response	35	10.7
Total Respondents	327	100.0

Table 8: Use of Boolean Operators in Searching

	Frequency	Percent
Always	12	3.7
Often	45	13.8
Sometimes	63	19.3
Rarely	40	12.2
Never	35	10.7
Never heard of it	91	27.8
No response	41	12.5
Total Respondents	327	100.0

Problems Encountered with Using Search Engines

The respondents also had one problem or the other with their use of Internet search engines. Table 9

Table 9: Problems Encountered in Using Search Engines

	Frequency	Percent
Coping with too much information	84	25.7
Selecting search words	76	23.2
Finding relevant information	72	22.0
Inactive/dead links	32	9.8
Out of date links	2	0.6
Non problems	19	5.8
No response	42	12.8

(N=327)

shows that the problem mentioned by the highest number of respondents (25.7%) was coping with too many retrieved information sources during searches. Other problems mentioned were: selecting search words, 76 (23.2% of the respondents); finding relevant information, 72 (22.0%); out of date links, 2 (0.6%); inactive/dead links, 32 (9.8%). Surprising, 19 (5.8%) of the respondents reported having encountered no problem.

Search Engine Use for Academic Work

The study also investigated the extent to which search engines have become a constant information seeking tool among research students at the University, which may be gauged by the number of hours the students were spending using search engines on the Internet. Most of the respondents (147 or 45%) reported *few times a week*, 71(21.7%) reported *once in a while*, and 49 (15.0%) reported

few hours/day (Table 10). Only 33 (10.1%) of the respondents had been using search engines for *several hours/day* since the start of their courses of study.

Table 10: Frequency of Search Engine Use since the Start of Respondents' Postgraduate Programmes

	Frequency	Percent
Several hours per day	33	10.1
Few hours per day	49	15.0
Few times per week	147	45.0
Once in a while	71	21.7
No response	27	8.3
Total Respondents	327	100.0

Table 11 shows the extent to which search engines were used by the respondents in four different types

Table 11: Reliance on Search Engines for Information for Academic Work

	Very Much	Fairly Much	No Much	Don't Rely on	No Response	Total
Doing project/ research work	172 (52.6%)	84 (25.7%)	27 (8.3%)	3 (0.9%)	41 (12.5%)	327 (100%)
Writing term paper	135 (41.3%)	104 (31.8%)	34 (10.4%)	3 (0.9%)	51 (15.6%)	327 (100%)
Doing course assignment	130 (39.8%)	99 (30%)	47 (14.4%)	14 (4.3%)	37 (11.3%)	327 (100%)
Learning more about a subject	136 (41.6%)	90 (27.5%)	53 (16.2%)	7 (2.1%)	41 (12.5%)	327 (100%)

N=327

of academic work listed in the questionnaire. The data shows than more than 69% of respondents relied on search engines either 'very much' or 'fairly much' in each of the activities.

Use of Search Engines to Find Region-Specific Information

Table 12 shows the data in respect of the respondents' search for region-specific information through search engines. The data shows that 40% and 34.5% of the respondents used the search engines 'always' or 'often' to search for Europe- and North America-

Perceptions of Search Engine Characteristics and Performance

Table 13 summarises respondents' perceptions of the nature of their previous interactions with search engines. Very high proportions of the respondents agreed (combining *agreed* and strongly *agreed* responses) that search engines were useful for academic purposes (86.6% of the respondents); that search engines enhanced their academic performances (80.7%); and that they usually found the information they were looking for with the search engines (80.5%). Moderately high proportions of

Table 12: Use of Search Engines to find Region-Specific Information

	Always	Often	Some-times	Rarely	Never	No response	Total
Africa	25 (7.6%)	56 (17.1%)	84 (25.7%)	68 (20.8%)	49 (15.0%)	45 (13.8%)	327 (100.0%)
Nigeria	34 (10.4%)	54 (16.5%)	93 (28.4%)	59 (18.0%)	47 (14.4%)	40 (12.2%)	327 (100.0%)
Other African Countries	13 (4.0%)	38 (11.6%)	83 (25.4%)	76 (23.2%)	66 (20.2%)	51 (15.6%)	327 (100.0%)
Europe	60 (18.3%)	71 (21.7%)	56 (17.1%)	47 (14.4%)	44 (13.5%)	49 (15.0%)	327 (100.0%)
North America	43 (13.1%)	70 (21.4%)	48 (14.7%)	58 (17.7%)	61 (18.7%)	47 (14.4%)	327 (100.0%)

specific information respectively. The corresponding proportions of respondents that used the search engines for information specific to Africa, Nigeria and other African countries (apart from Nigeria) were lower, at 24.7%, 26.9% and 15.6% respectively.

respondents agreed that too many search results were usually returned for their search (57.8%); that they usually found the most relevant information on the first page of the search results (43.2%); and that they did not usually look beyond the first five pages of

Table 13: Perceptions of Search Engine Characteristics and Performance

	SA	A	D	SD	Not Sure	No Response	Total
I usually find the information I am looking for when I use Internet Search Engines	62 (19.0%)	201 (61.5%)	27 (8.3%)	5 (1.5%)	6 (1.8%)	26 (8.0%)	327 (100.0)
I usually find the most relevant information on the first page of the search results	44 (13.5%)	97 (29.7%)	128 (39.1%)	16 (4.9%)	14 (4.3%)	28 (8.6%)	327 (100.0)
I don't usually look beyond the first page of the search results for relevant information	11 (3.4%)	32 (9.8%)	156 (47.7%)	95 (29.1%)	7 (2.1%)	26 (8.0%)	327 (100.0)
I don't usually look beyond the first 5 pages of the search results for relevant information	30 (9.2%)	94 (28.7%)	114 (34.9%)	52 (15.9%)	13 (4.0%)	24 (7.3%)	327 (100.0)
Too many search results are usually returned for my search	47 (14.4%)	142 (43.4%)	65 (19.9%)	12 (3.7%)	22 (6.7%)	39 (11.9%)	327 (100.0)
I usually find Internet search engines difficult to use	3 (0.9%)	13 (4.0%)	148 (45.3%)	125 (38.2%)	5 (1.5%)	33 (10.1%)	327 (100.0)
I usually find internet search engines useful for academic purposes	147 (45.0%)	136 (41.6%)	3 (0.9%)	3 (0.9%)	1 (0.3%)	37 (11.3%)	327 (100.0)
My use of Internet search engines enhances my academic performances	103 (31.5%)	161 (49.2%)	16 (4.9%)	6 (1.8%)	15 (4.6%)	26 (8.0%)	327 (100.0)

the search results for relevant information (37.9%). Only 13.2% of the respondents agreed that they did not usually look beyond the first page of the search results for relevant information, and only 4.9% agreed that they usually found Internet search engines difficult to use.

Discussion

The findings of the study show that most of the responding postgraduate students were aware of, and had become familiar with, the Internet before the start of their postgraduate courses. Most of the students had also been using search engines to browse the Internet, and many of them had cause to use search engines at least *once a while*. Most of the respondents however learned to use search engines through their friends, while many others learned by trial and error.

Respondents overwhelmingly chose Google as their preferred search engine, and most of them chose either quality of items retrieved and/or the user friendliness of the search engine interface as the reasons for their preference. The preponderant preference for Google relative to Yahoo! is the opposite of what Akporido (2005) found among urban cybercafé users in Delta State of Nigeria. Akporido's sample comprised both students (possibly at different levels of education) and non-students. The reversal of the popularity of the two search engines in the present study is probably due to two factors: (i) greater homogeneity and higher research motivation of this study's sample compared to Akporido's sample; and (ii) possible belief by respondents that Yahoo! covered a greater diversity of (research and non-research) sources than Goggle, and/or that Google focused more on research information sources than Yahoo!.

The students believed that they were confident of their abilities to use Internet search engines. However, analyses also show that the students most probably used very simple queries, as they were mostly unaware of the advanced search options of Google or Yahoo! (their most preferred engines), or of the possibility of using Boolean operators to broaden or narrow their searches. Clearly, the students' 'confidence' was relative to what they knew about specific search engines (evidently minimal), rather than the complete range of information

searching functions provided by each engine. The minimal knowledge of search engine facilities by the students might be due to the mode through which most of them acquired their search engine knowledge and skills, which was through friends (who might not have known much about search engines functions themselves) and trial and error.

The students also relied heavily on search engines for their academic work, and particularly for project/thesis work and term papers. Most of them used search engines to search for information on subjects or topics relating only to such academic work, and most of them also confirmed that their use of search engines improved their academic performances. Searching for job vacancies was the only other non-academic activity for which the students used search engines. In other words, the students seldom used search engines for leisure, mundane or non-academic information seeking. The focus by students on the use of search engines to find information for only important academic and job search purposes contrasts those of a study of the Pew Internet and American Life Project (2005), which found that only 28% of searchers say most of the information they search for is important to them, whereas 55% of searchers say about half the information they search for is important to them and half trivial, and the remaining 17% say that the information searched for is mostly trivial. It is however important to note that the Pew Internet study was based on a sample drawn from the general population of Americans (including students and non-students older than 18 years), which probably partly explains the differences in the findings. The focus of the postgraduate students in this study on the use of search engines for seeking only important information could also be explained by a number of factors associated with the students and their environment, including the low level of Internet access on campus or at home, the low level of Internet sophistication, high cost of commercial Internet access, and poor reading (and hence, poor Internet for leisure) habits.

Most of the students agreed that they found the information they were looking for, when they used search engines. They also agreed that too many hits are most often returned for their searches, but most also disagreed that search engines are difficult to use. These and other findings of the study suggest

that the students most often used simple queries, retrieved lots of hits, and also often painstakingly browsed many displayed web pages to get the information they required. They could however have reduced their browsing workload by using sophisticated queries containing Boolean operators in the advanced search options provided by the search engines. Although most of the students claimed that they found the information they were looking for, their preponderant use of simple queries on mostly one or two search engines (Google and Yahoo!) could mean that the information that they found might not have been the best that could be obtained from the Internet on their search topics. These findings, although obtained from a developing country context, are generally similar to those obtained by the Pew Internet and American Life Project (2005), which reports that 44% of the sampled searchers say they regularly use a single search engine (25% in this study as shown in Table 5), 48% will use just two or three (58.1% in this study), and only 7% will use more than three (7% also in this study). The Pew Internet study also concludes that American Internet users are very positive about their online search experiences, although most searchers use search engines conservatively and are naïve about search engines and search results. These findings are also similar to those of this study as summarised in Tables 6 and 7.

Conclusion

The findings of this study show clearly that the use of search engines to find information on the Internet for academic purposes is an established and growing practice among postgraduate students of the University of Ibadan. However, there is also clear evidence that students need help to improve their knowledge of search engines, in order to enhance their efficiency in using search engines for academic and other activities. In other words, the students need help to improve their 'information literacy' skills in respect of the use of search engines to find high quality information to solve their academic and other social problems. The findings of the study confirm clearly the continuing need for educators in African universities to integrate adequate information (technology) literacy content into the curriculum for research students in the universities.

References

Ajuwon, G. A. (2003) Computer and Internet Use by First Year Clinical and Nursing Students in a Nigerian Teaching Hospital. *BMC Medical Informatics And Decision Making*, 3:10 September, Available at: www.Biomedcentral. Com/1472-6947/3/10 (Accessed: 7 March 2006).

Akporido, C. E. (2005), Internet Use in a Nigerian Suburban Setting. *The Electronic Library*, 23 (3) 302-310.

Aman, M. (2004) Use of Malaysian Academic Library Websites by University Students. *Information Development*, Vol. 20 (1) 67-72.

Applebee, A., P. Clayton, C. Pascoe and H. Bruce (2000) Australian Academic Use of the Internet: Implications for University Administrators. *Internet Research: Electronic Networking Applications and Policy*, 10(2)41-149. Available at: www.Emeraldinsight.Com/Insight/ (Accessed: 14 March 2006).

Armstrong, C., Fenton, R., Lonsdale, R., Stoker, D., Thomas, R. and Urquhart, C. (2001) A Study of the Use of Electronic Information System by Higher Education Students in the UK. *Program*, Vol. 35 No. 3, Pp.241-262, Available at: Http:// www.Emeraldinsight.Com/Insight/ (Accessed: 14 Arch 2006).

Healy, L. W. (2002) The Voice of the User: Where Students and Faculty go for Information. (Highlights of the Outsell/DLF Study of the Academic Information Environment) Outsell, Inc. Available at: www.Ukoln.Ac.Uk/Events/ Jisc-Cni-2002/Presentations/Leigh-Watson.Ppt (Accessed: 6 March 2006).

Jagboro, K.O. (2003) A Study of Internet Usage in Nigerian Universities: A Case Study of Obafemi Awolowo University, Ile-Ife, Nigeria. *First Monday*, Vol. 8 No. 2 (February). Available at: Http://Firstmonday.Org/Issues/Issue8_2/ Jagboro/Index.Html (Accessed 6 March 2006).

Jensen, M. (1998) The Africa Internet – A Status Report. Available from http://www3.Sn.Apc.Org/Africa/Afstat.Htm (Accessed: 27 June, 2005.

Kling, R. (1999) Can the Next Generation Internet Effectively Support Ordinary Citizens? *The Information Society*, 15 (1)57-63.

Korgen, K., Odell, P. Odell and Schumacher, P. (2001) Internet Use Among College Students: Are there Differences by Race/Ethnicity?. *Electronic Journal of Sociology, ISSN: 1198 3655*, Available at: Http://Www.Sociology.Org/Content/Vol005.003/Korgen.Html (Accessed: 6 March 2006).

Mcfadden, A.C. (1999) College Students' Use of the Internet at the University of Alabama. *Education Policy Analysis Archive*, Vol. 7 No. 6 (February). Available at: www.Epaa.Asu.Edu/Epaa/V7n6.Html (Accessed 7 March 2006).

Obenaus, G. (1994) The Internet – An Electronic Treasure Trove. *ASLIB Proceedings*, 46 (4) 95-100.

Ojedokun, A.A. (2001) Internet Access and Usage by Students of the University of Botswana. *African Journal of Library, Archives and Information Science*, 11 (2) 97-107.

Pew Internet And American Life Project (2002) The Internet Goes to College: How Students are Living in the Future With Today's Technology. Available at: http://www.Pewinternet.Org/Pdfs/PIP_College_Report.Pdf (Accessed: 7 March 2006).

Pew Internet and American Life Project (2005) Search Engine Users. Available at: Http://www.Pewinternet.Org/Pdfs/PIP_Searchengine_Users.Pdf (Accessed: 1 June 2007).

Sani, A. and Tiamiyu, M. (2005) Evaluation of Automated Information Services in Nigerian University Libraries. *The Electronic Journal*, 23 (3) 274-288.

Shapiro, J.J. and Hughes, S.K. (1996) Information Literacy as a Liberal Art: Enlightenment Proposals for a New Curriculum. *Educom Review (Online)*. V31 (2) (March/April), Available at: Http://www.Educause.Edu/Pub/Er/Review/Reviewarticles/31231.Html (Accessed: 16 March 2006).

Tiamiyu, M. and Salako, O. (2007) Coverage of some Africa-Specific Internet Information Sources by some Major Search Engines. *Ghana Library Journal*, 19 (2) 2007 In press.

University of Texas at Austin, Counselling and Mental Health Center (1997) News Flash: New Data On Internet Use> Available at: http://www.Utexas.Edu/Student/Cmhc/Research/Internet.Html (Accessed: 7 March 2006).

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Citation Analysis of Dissertations Accepted by the Department of Information Studies, University of Ghana, Legon

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Abstract

A citation analysis of dissertations accepted by the Department of Information Studies at the University of Ghana, Legon, from 1998 to 2004, was performed with a view to ascertain patterns in the use of different types of information source formats such as books, journals, etc. A total of 67 dissertations generated 2,212 citations. Books and monographs were cited more than journals: 969 or 43.8% of the citations were books and monographs, followed by journal articles (550 or 24.9%), and unpublished materials (4 or 0.2%) being the least cited material. These findings corroborate the work of other authors in the social sciences. The study also found out that information technology and evaluation of service are emerging and most active research areas, whereas reading habits being was relatively an obsolescent and inactive research area.

Introduction

Gooden (2001) defines citation analysis as 'a wide ranging area of bibliometrics that studies the citations to and from documents. Such studies may focus on the documents themselves or on such matters as: their authors; the journals (if the documents are journal articles) in which the articles appear (Gooden, 2001) quoting Diadoto. One type of in-house evaluation often used by librarians to assist in collection maintenance is citation analysis. This technique provides insight on emerging and obsolescent research areas. Citation analysis is an excellent unobtrusive method to determine which resources doctoral students are using (Buttlar, 1999).

Theses and dissertations are useful primary sources of information, to which may be attributed the acceleration of research. In research works, the importance of journals cannot be underestimated (Gupta, 1984). They are important sources through which new discoveries of research findings, theories and opinions are disseminated (Iya, 1996).

The purpose of this study was to analyse citations in information studies dissertations from 1998 to 2004 at the University of Ghana, Legon; material type most cited; availability of most cited journals locally; the currency of the cited materials and the subject areas most cited. The period 1998-2004 was used for the study firstly, because 1998 was the first year in which the Master of Arts (MA) degree was awarded after the MA programme had been re-introduced. Secondly, at the time of the study, approved higher degree dissertations at the Department of Information Studies library were up to the year 2004.

Background

The Department of Information Studies (formerly Department of Library and Archival Studies) was established at the University of Ghana in 1965, and it forms part of the Faculty of Social Studies

(Alemna, 1991). Since its establishment, the Department has gone through various programme changes. It started first with an undergraduate programme leading to a B.A. in Library Studies. In 1967, the degree programme was changed to a two-year Graduate Diploma programme. This was later changed to a one-year Graduate Diploma programme. This programme continued until October 1997, when it was converted into a one-year M.A. programme (Alemna, 1999). Currently, the Department of Information Studies, offers programmes at the higher degree level, in M.A. in Library Studies, M.A. in Archival Studies, MPhil. in Library Studies, MPhil. in Archival Studies, Ph.D in Library Studies and Ph.D in Archival Studies.

The department has a library which is independent of the main University library and with a sizeable collection of 2,629 books and monographs and several journal titles, most of which are complimentary copies. There is also a sizeable collection (643) of long essays, theses and dissertations, ranging from the undergraduate level to the doctoral level covering 1971 to 2004. The library catalogue has been automated to make for easy access to materials in the library. The main University library (Balme Library) has a large collection of books and journals on information studies, and this complements the Departmental library.

Literature Review

Citation analysis is generally viewed in the literature as a form of checklist approach, and basically compares a library's holdings to an authoritative list for the purpose of assessing the quality of all or part of a collection (Ching and Chennupati, 2002). Citations drawn from student's dissertations or term papers was another source of checklist used in numerous studies, the earliest being that of Emerson's analysis of 23 engineering doctoral dissertations at the Columbia University between 1950 and 1954 (Heidenwolf, 1994) to determine the percentage of references held or not held by the other campus libraries in the university.

Citation analysis is now commonly used to determine what titles to purchase, to discontinue, or to weed (Smith, 1981). Sylvia (1998) more recently analysed the serial titles cited by psychology students in their research bibliographies to evaluate the use of a journal collection for the purpose of journal selection or deselection. She postulated that 'citation analysis as a collection evaluation method was perhaps a bit more useful for deselection than selection decisions. According to Gooden (2001), citation analysis has been used by librarians in various disciplines to eliminate costly low used/ unused journals, purchase needed materials and ascertain core journals needed for patron use, and to reveal the most active research in a particular area.

In Kanasy and Subramanya's work as quoted by Sylvia (1998), citation analysis is useful in identifying core journals because of the bibliometric phenomenon known as the law of scattering, which describes the manner in which articles on a subject are dispersed through the periodical literature. A small percentage of journals normally accounts for a large percentage of cited articles in any given field. The law of scattering predicts that about 80% of the citations will come from about 20% of the journals cited.

In Garfield's work on science as quoted by Okiy (2003), he demonstrated the importance of citation analysis as a tool for evaluation. Okiy argued that citation frequency and impact factor could be helpful in determining the optimum make-up of special and general collections. This can serve as a guide to determine the back files, binding and retention schedules of science journals.

The work of Gross and Gross, as quoted by LaBonte (2005), discovered that very few journals were cited frequently in the *Journal of the American Chemical Society*, while many journals were only cited once. Libraries should therefore be able to supply most of the needs of the users with a small number of journals.

Khan, et al. (1998) conducted a bibliometric study on library and information science literature in Bangladesh from 1966 to 1997. The results showed that during 1966-1997, a total of 308 articles were authored by 116 professionals in 32 years, that is on average 9.62 articles per year and 2.6 articles per author in 32 years (0.08 articles per person per year). All the papers were published in some 37 periodicals originating from 14 countries.

In her work on education dissertations in Nigeria, Okiy (2003) concluded that majority of postgraduate students in education used textbooks more than other forms of library materials in writing their dissertations. This is indicated by 2418 (60.3%) citations given to books.

An earlier study by Aina (1991) on the nature and trends of library and information research in Africa revealed that prominent areas of research by African information professionals were library and information resources, archives and library education. It was also found that researchers consulted more books than journals, and a majority of the materials cited were published outside Africa. A follow-up study by Alemna and Badu, however, showed the predominance of serial literature among the materials cited. In that study, serial literature accounted for 415 or 48.37% of the citations, while books accounted for 218 or 25.41% of the citations. A majority of the journals cited, however, came from outside Africa (Alemna & Badu, 1994).

Mabawonku's analysis of papers published in the *African Journal of Library, Archives and Information Science* during the period 1996-2000 revealed that library and information science researchers in Africa overwhelmingly cited papers published in the UK and USA, as both countries published 62% of the papers cited, compared to 50% of publications that were published by both countries during 1991-1995 (Mabawonku, 2002).

Omekwu (1998) examined the author and journal citation patterns of agricultural communication theses at the Department of Agriculture Extension Services, University of Ibadan. The results of the bibliographical references of 37 theses studied showed a very significant difference in the citation of Nigerian and non-Nigerian authors, with non-Nigerian authors cited more than Nigerian authors.

Dulle, et. al. (2004) in a study to analyse citation patterns of agricultural scientists in Tanzania, revealed that of the publications analysed, journals were more highly consulted (44.3% of total citations), compared to other sources of literature

(books – 25.1%; proceedings – 10.3%; theses – 4.2%; reports – 5.7%; and other sources – 10.4%).

In another study by Aina and Mabawonku (1997), they found that in the publications of information professionals, journals constituted 41.4 per cent of the items cited, followed by books, 24.9 per cent.

The current study builds on previous studies, and seeks to use this method to aid collection development in information studies. Ideally, examination of past material use (particularly journals) should suggest future material use by information studies graduate students.

Methodology

The study examined 67 Master of Arts dissertations accepted in the Department of Information Studies, University of Ghana, Legon, from 1998 to 2004, and was limited to the dissertations housed in the library of the department. The title page and reference sections of the 67 dissertations were photocopied, and information was extracted from them. The extracted information from each dissertation included the name of the student, the title of the dissertation, year of award, location of cited work, number of citations, and the total of each cited work. The cited works in each dissertation were then categorised into: books and monographs, journals, theses and dissertations, conference proceedings, reports, online sources, newsletters and unpublished materials. These were counted according to their citation frequency. The data collected are presented in the form of tables, and percentages under various headings, as follows.

Results and Discussions

The 67 dissertations generated a total of 2,212 citations, averaging 33 citations per dissertation. As indicated in Table 1, books and monographs were cited most frequently (969 or 43.8%), followed by journal articles (550 or 24.9%), reports (248 or 11.2%), newsletters (163 or 7.4%), theses and dissertations (127 or 5.7%).

Table 1: Format of Literature Cited

Format	Number of Citations	%
Books and Monographs	969	43.8
Journals	550	24.9
Reports	248	11.2
Newsletters	163	7.4
Theses and Dissertations	127	5.7
Online Sources	118	5.3
Conference Proceedings	33	1.5
Unpublished Materials	4	0.2
Total	2212	100.0

Table 2: Top Fifteen Core Journals Cited

Rank	Journal Title	Number of Citations
1	Library Management	44
2	Library Trends	31
3	Ghana Library Journal	27
4	Library Review	25
5	International Information and Library Review	22
6.	College and Research Libraries	21
7	Special Librarian	21
8	Nigerian Libraries	18
9	Library Acquisitions: Practice & Theory	14
10	Aslib Proceedings	12
11	Library Association Record	10
12	Library Journal	9
13	African Journal of Library, Archives and Information Science	8
14	Journal of the American Society for Information Science	8
15	African Publishing Review	8
	Total	278

This finding corroborates the work of Okiy (2003), who reported in her work on education theses in Nigeria that books and monographs (2418 or 60.3%) were cited more than journal articles (982 or 24.5%). However, Gooden (2001) reported that more journal articles (3178 or 85.8%) were cited than monographs (311 or 8.4%) in her work on chemistry doctoral dissertations at the Ohio State University. The study also revealed that an increasing number of students used online sources (118 or 5.3%) in their work. This may be an indication of the growing prominence of online sources.

According to Edwards (1999), "citation analysis can also be used to determine a core collection of journals critical to local users and representative of the research needs of the collection." In the current study, 154 journal titles generated 550 citations, being an average of 3.57 citations per journal title. An analysis of the journal titles revealed that 95 or 61.7% of them were cited only once. Further analysis indicated that the remaining 59 or 38.3% of the journals titles were cited two or more times. This generated 455 citations, representing 82% of the total citations. This finding is consistent with the law of scattering, which predicts that 80% of the citations will come from about 20% of the journals cited.

Out of the 154 journals cited, 15 of them, as indicated in table 2, were cited eight or more times. This generated 278 citations, which are about 50.5% of the total journal articles cited.

Lal and Panda (1996) and Edwards (1999) found similar results in citation analyses of journals in plant pathology and polymer science respectively. These statistics suggest that a small percentage of journals contain a high percentage of references found in the above studies and concur with Zipf's Law as quoted by LaBonte that 'while a few items occur often, many items occur rarely.' (LaBonte, 2005). It also validates Kriz's observations that libraries can supply users with majority of journal articles by subscribing to a small number of journals (Kriz, 1977).

In order to determine the local availability of cited journals, the journals that were cited eight or more times were cross-checked with the library holdings to find out which of them were available in either the main University library or the Department library.

Out of the 15 most cited journals, 12 are available in the library of the Department of Information Studies while two, namely: *College and Research Libraries* and *African Publishing Review*, are available in the main (Balme) library. One of the titles – *Library Acquisitions: Practice and Theory* (continued as: *Library Collections, Acquisitions, and Technical Services from Vol. 23 Issue, 1999*) which had been cited 14 times could not be found in any of the two libraries. It is likely that the students consulted the online version of the journal, or it may have been cited from a secondary source without proper citation of the citing sources.

A further examination of table 2 also shows that all the 15 most cited journals were foreign journals except the *Ghana Library Journal*. This is to be expected, as there is only one prominent journal in Ghana which deals with library and information related issues, unlike in Nigeria, for instance, where there is more than one publication. As shown by table 2, only four journals from Africa ranked among the top 15, with the majority of the journals from Europe. This corroborates a similar finding by Alemna and Badu (1994) where only three journals from Africa ranked among the top 10, with the majority of them from the USA and UK.

The books and monographs statistics gave an indication of scattering of the materials than the journal articles, as several different titles were used in the study. The most cited book was *Libraries and Information Provision in Ghana* by A.A. Alemna (22 times). Twelve of the 969 book titles were cited twice. Most of the books and monographs were cited once.

Materials in the current study cited date as far back as 1945 (*College and Research Libraries*), and the most current material cited was published in 2004 (*several online sources*).

Table 3: Citations by Decade

Years	Number of Citations	% of all Citations
1940s	3	0.54
1950s	4	0.73
1960s	32	5.82
1970s	55	10.00
1980s	132	24.00
1990s	292	53.09
2000s	32	5.82
Total	550	100.00

The citations therefore span a period of over sixty years as shown in table 3. However, majority of the materials cited were from the mid-1990s to late 1990s (292 or 53.09%). Thirty nine (39) or 7.09% of the citations were pre-1970. This result shows the currency of the materials cited in the dissertations. It may also be an indication that the older journals are not being consulted very much by the students, and could be digitiised and taken off the shelves to create space for newer publications.

The study further examined the subject areas of research of the 67 dissertations. As revealed in table 4, they were mainly in the area of: information technology (17), publishing and the book trade (5), information management (10), information needs (7), information use (4), user services (10), reading habits (3), and evaluation of services (11).

The result indicates that information technology was the most popular research area among graduate students, followed by evaluation of information services. It also suggests that information technology and evaluation of information services are emerging and most active areas of research, with reading habits, unfortunately, being an inactive research area. It is also an indication that there is a greater need for materials in information technology and evaluation of information services than reading habits and information use. This result corroborates

the work of Abdoulaye, where analysis showed that information technology (OPAC, CD-ROM and the Internet) was the most popular research area among the students (Abdoulaye, 2002).

Table 4: Subject Area of Research

Research Area	Frequency	%
Information Technology	17	25.4
Publishing and Book Trade	5	7.5
Information Management	10	14.9
Information Needs	7	10.4
Information Use	4	6.0
User Services	10	14.9
Reading Habits	3	4.5
Evaluation of Service	11	16.4
Total	67	100.0

It is not surprising that information technology is the most popular research area since the world has gone digital, and many people especially the younger generation are fascinated by it.

Implications for the Library and Information Profession

The results of the study have a number of implications which should be brought to the notice of library managers, library institutions and associations. A significant finding of the study is that a few journals (15) generated 278 citations. What this means is that libraries do not have to subscribe to many journals in order to meet the information needs of their clients. It therefore calls for further research by information professionals to select the core journals that users may require.

The study also found a growing prominence of online sources and information technology as an emerging and active research area. This suggests to information professionals to be proactive in their information gathering, storing and dissemination roles, to be able to meet the information needs of clients in a timely manner. With information technology and online sources becoming very prominent over the more traditional sources,

information professionals should update their knowledge and skills to meet the challenges that the new technologies come up with.

The results of the study clearly indicate that citation analysis is a useful tool for evaluating the use of library materials. It may be used in combination with analyses of information needs and user behaviour to select materials for libraries and information centres. Citation analysis may be the basis for selecting one particular material over another. It may assist in making projections into the future about which materials to acquire (materials that will be used) and in what quantities.

Studies of this nature are very useful for the library and information profession and should therefore be undertaken on a five-yearly basis, in order to assist libraries and information centres in their collection development effort and the judicious use of the small library budgets of most African countries.

The study reveals that books and monographs were cited more than journals and other materials. Additionally, it was found that the majority of the materials cited (299 or 53.09%) were from the mid-1990s to late 1990s. Older materials were rarely cited by graduate students. Information professionals should therefore focus more on current materials, instead of storing older materials. The older materials could be digitised and made available online for use. The print copies of the materials may then be weeded to create space for storing the current materials to be acquired.

One other finding of this study is that the majority of the most frequently cited journals were published outside Africa. This is a very serious issue that should engage the attention of library and information professionals and library institutions and associations in Africa. Attempts should be made to improve on the quality and reliability of African journals. It is most likely that because of the unreliable publication patterns of most African journals, most authors who would otherwise have published their work in Africa turn to Europe or USA. This is not good enough and library professionals, institutions and associations, should assist in establishing high quality, reliable journals in each country in Africa. This may in a way stem

the trend of foreign journals being cited for work done in Africa, and thereby giving the foreign journals undue prominence over African ones.

The library and information profession should not regard dissertations as mere academic exercise but as important sources information to be used as a strategic tool for planning and development of libraries and information centres. Further studies should be undertaken to find out how the results of the studies could be fed back into the national information development agenda. The benefits to be derived from such an exercise may be many and varied.

Conclusion

The study investigated MA dissertations submitted to the Department of Information Studies, University of Ghana, Legon, from 1998 to 2004. It explored the format of materials cited, the frequency of the cited materials, the currency and the availability of the materials cited and the subject areas of research over the period. The study reveals a general preference for books over journals. This may be due to the fact that books are readily available in Ghanaian libraries than journals, and possibly also because, the prices of books may be cheaper than that of journals; so, most libraries are unable to subscribe to journals. It is, therefore, easier to access books and monographs than journals. It is therefore necessary to re-examine the acquisition policy with regard to journal subscription. It is suggested that the DIS library needs to increase its book acquisition and reduce the number of journal titles. On the other hand, in order to increase the stock of journals, it will be necessary for more online journals to be subscribed, as the results indicated that more and more students are making use of online sources. The study, again, provided insight into emerging areas of research (information technology) and obsolescent areas of research (reading habits). The results of the study should therefore inform acquisitions librarians on the areas to concentrate on in their acquisition of library materials by content and formats.

Though the current study was undertaken in a local situation, it is possible to replicate it at the national level to cover more universities and more disciplinary areas, and compare the results. The outcome should be of benefit to university libraries selecting to improve on the existing information studies collection.

References

Abdoulaye, Kaba (2002) Research Trends in Library and Information Science at the International Islamic University Malaysia. *Library Review* 51(1) 32-37.

Aina, L.O. (1991) Directions of the Information Professions in Africa as Reflected in the Literature. *International Library Review* 23 (4) 365-380.

Aina, L.O. and Mabawonku, I.M. (1997) The Literature of the Information Profession in Anglophone Africa: Characteristics, Trends and Future Directions. *Journal of Information Science* 23 (4) 321-326.

Alemna, A.A. (1991) Characteristics and Careers of Past Post-Graduate Diploma Students of the Department of Library and Archival Studies, University of Ghana, Legon, 1981/1982 – 1987/1988. *Education for Information* 9 (2) 121 - 128.

Alemna, Anaba and Badu, Ellis (1994) The Nature and Trends in Research and Journal Literature in English Speaking Africa. *International Information and Library Review* 26 19-30.

Buttlar, L. (1999). Information Sources in Library and Information Science Doctoral Research. *Library and Information Science Research* 21 (2), 227-245.

Ching, Joanna Tan Yeok and Chennupati, K.R. (2002) Collection Evaluation through Citation Analysis Techniques: A Case Study of the Ministry of Education, Singapore. *Library Review* 51(8) 398-405.

Dulle, F.W. et. al. (2004) Creating a Core Journal Collection for Agricultural Research in Tanzania: Citation Analysis and User Opinion Techniques. *Library Review* 53 (5) 270-277.

Edwards, S. (1999) Citation Analysis as a Collection Development Tool: A Bibliometric Study of Polymer Science Theses and Dissertations. *Serials Review* 25(1) 11-20.

Gooden, Angela M. (2001) Citation Analysis of

Chemistry Doctoral Dissertations: An Ohio State University Case Study. Available at: Http://www.Istl.Org/01-Fall/Refereed.Html. Accessed 4 December 2006.

Gupta, S. (1984). An Analytic Study of Theses Literature of Science and Technology of Nigeria Universities for the Period 1948-1978. *Nigerian Library And Information Science Review* 2 (1&2) 37-46.

Heidenwolf, T. (1994) Evaluating an Interdisciplinary Research Collection. *Collection Management* 18 (3&4)33-48.

Iya, A.I. (1996) A Citation Study of Education Dissertations at the University of Maiduguri, Nigeria. *African Journal of Library, Archives and Information Science* 6 (2) 129-32.

Khan, M.S. et al. (1998) Library and Information Science Literature in Bangladesh: A Bibliometric Study. *Malaysian Journal of Library and Information Science* 3 (2) 11-34.

Kriz, H.M. (1977) Citation Counting and the Future of Engineering Libraries. *Engineering Education* 67: 707-710.

Labonte, Kristen B. (2005) Citation Analysis: A Method for Collection Development for a Rapidly Developing Field. Available at: Http://www.Istl.Org/05-Summer/Refereed.Html. Accessed 4 December 2006.

Lal, A. & Panda, K.C. (1996) Research in Plant Pathology: A Bibliometric Analysis. *Library Science*. 33 (3) 135-147.

Mabawonku, Iyabo (2002) Trends in Library and Information Science Research in Africa, 1991-2000. *African Journal of Library, Archives and Information Science* 11(2) 79-88.

Okiy, Rose B. (2003) A Citation Analysis of Education Dissertations at the Delta State University, Abraka, Nigeria. *Collection Building* 22 (4) 158-161.

Omekwu, Charles O. (1998) Author and Journal Citation Patterns of Agricultural Communication Researchers at the University of Ibadan, Nigeria. *African Journal of Library, Archives and Information Science* 8 (2) 105-112.

Smith, L. (1981). Citation Analysis. *Library Trends* 30: 83-106.

Sylvia, M.J. (1998) Citation Analysis as an Unobtrusive Method for Journal Collection Evaluation Using Psychology Student Research Bibliographies. *Collection Building* 17 (1) 20-28.

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ICT Integration in Botswana Secondary Schools: Digital Divide Factor and Implications for Information Literacy

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Abstract

The principles of the World Summit on Information Society include but are not limited to, building of information infrastructure through telecommunication and investment in technology; achieving universal and equitable access to information technology; and making information a common good. It is in that context that this paper discusses efforts being made by the Government of Botswana to integrate ICT in secondary school education. However, the digital divide factor remains the major barrier in this endeavour. The authors provide suggestions based on global practices on how the digital divide problem can be addressed in secondary schools. This is to prepare the country to effectively partake in the global information society, to which Botswana subscribes to.

Introduction

Early use of ICTs in the classroom involved mainly the use of stand alone computers and simple data entry devices, which did little to change the overall approach to teaching and learning in most schools. However, the emergence of the Internet in the 1990s and the development of networked environments encompassing a range of computer, multimedia and communication technologies resulted in much greater focus on interactive and connected learning experiences for learners (Department of Education and Youth Affairs, 2001). Increasingly, integration of ICT in education is becoming the preoccupation of policy makers, researchers and education managers the world over. Toomey (2001) points out that integration of ICT in schools is intended to improve and offer flexible learning opportunities. Similarly, Levert (2003) discusses various uses of ICTs in education. For example, TI-83 Plus is an application for creating charts, graphs, visualising and practising problem simulations that are so important in reinforcing complex mathematical relationships. Livingstone (2004) notes that laptops encourage self-directed learning, as learners can use them to maintain electronic portfolios of their work, which, when posted on the Web, can allow viewing and sharing with other people

The use of ICTs in education is underpinned by various learning theories; two of the most current and pervasive being the Constructivist and Conversational Models. Constructivism is a process by which the learner develops understanding and constructs knowledge through interactions with the environment (Savery and Duffy, 1995). Moreover,

through constructivism, learners are able to actively construct their own knowledge, while their minds mediate input from the outside world to determine what they will learn. Through constructivism, the learner takes greater responsibility for his or her own learning by collaborating with peers, and testing personal hypotheses.

The Conversational Model, on the other hand, describes teaching and learning processes as dialogic relationship between tutor and student. Laurillard, the architect of this model, noted that essentially, a learning process that is complex enough to achieve the aims of academic learning must involve at least two participants operating iteratively and interactively on two levels, namely: practice and discussion (Laurillard, 1999). The conversational model has implication for teachers in terms of manipulating and exploiting pre-existing technological resources.

Botswana's Education System and ICT Infrastructure

Botswana has a population of about 1.7 million people with a rapidly expanding education system. About 95.3% (332,777) of primary school age children (7-13 year age group) were enrolled in formal education in 2002 (Mailtlamo, 2004). The transition rate from Standard 7 to Form 1 is approximated at 96.0%. With regard to tertiary education, there has been a consistent increase in the numbers of learners at the tertiary level. For example, the University of Botswana, the only public university in the country at the moment, has 15,725 students (University of Botswana, 2005). In 1982, when the University was established, there were 1082 students

The intent to use ICT in education is well articulated in the national development strategy known as Vision 2016 which succinctly states that by the year 2016, 'Botswana will have entered the information age on an equal footing with other nations, and all level of schooling will have access to state-of-art ICT to support learning process (Presidential Task Force, 1997). Vision 2016 integrates well with the declaration of principles of the World Summit on Information Society (WSIS) (WSIS, 2003, which defines an information society as a society which is inclusive, where all persons

without distinction of any kind are empowered freely to create, receive, share and utilise information and knowledge in any media, and regardless of frontiers. To achieve these goals, various strategies are needed to be taken by all stakeholders, including, governments. These strategies include but are not limited to:

- Eliminating illiteracy and enhancement of ICT literacy;
- Putting in place education programmes in ICTs;
- Putting in place continuous training programmes in ICTs for the benefit of all;
- Bridging the digital divide;
- Enabling access by all people to information through use of ICTs;
- Developing human capacity to exploit the benefits of ICTs;
- Building of public awareness on the capabilities of ICTs;
- Enhancing universal access through deployment of affordable ICTs;
- Improvement of connectivity;
- Providing technical assistance and support to ICTs; and
- Making available appropriate electric power sources.

Botswana's current education network does not make effective provision for achieving the aspirations of WSIS. Critical elements that should be considered when considering integration of ICT in education to meet WSIS in the words of Maitlamo (2004) include determining whether (Maitlamo, 2004):

- Current educational network provides universal access to ICT;
- Educational system integrates ICT into its curriculum and administrative processes to improve the quality of education; and
- There are technical training programmes in the community that can train and prepare a productive and innovative ICT workforce outside of the formal education system

An ICT audit in Botswana's education system in 2004 revealed that (Maitlamo, 2004):

- PC penetration in schools was limited;
- There were virtually no PCs or ICT education integrated in the primary school system;

- Some secondary schools had computer laboratories with up to 20 computers per lab;
- Computer labs were generally open only for computer studies during the day and closed after school;
- A small number of schools were networked through an internal LAN with a file and mail server, and a network printer;
- Some labs in government secondary schools were networked and had dial-up or satellite access to the Internet; and
- Majority of computers are Pentium II or better; and
- There are no computer or network technicians in schools.

Despite efforts by government to equip all secondary schools with computers and Internet access, computer studies as a subject is not fully integrated within the curriculum. Only senior secondary schools' curriculum (forms 4 and 5) offers computer studies as an examinable subject. Junior secondary schools (forms 1-3) curriculum has yet to incorporate computer studies, largely because government started the process of equipping the more than 206 junior secondary schools with computers only in the last three years, and not many schools have so far been covered. The junior secondary schools that have access to computer offer computer studies as an optional, non- examinable subject. It is expected that once most schools have a critical mass of computers, it will be prudent for the curriculum to offer computer studies in junior secondary schools as an examinable subject.

ICT training for school computer teachers is currently being provided through the Mochudi Media Centre, an upcoming urban centre, located 45 kilometres North East of Gaborone (the capital city). The centre provides training, advice, guidance and support to educational professionals, including ICT training for the schools and the Department of Teacher Training and Development. There are other support centres across the country providing computer training to teachers that are discussed later in this paper.

ICTs Use and Training Programmes in Botswana's Secondary Education Sector

Within Botswana's secondary schools, most often, computers are reserved for IT classes in senior secondary schools or for computer awareness in junior secondary schools. Some laboratories are available after class hours for a short time for walk-in learners or teachers. A teacher or supervisor must be available to keep the laboratories open to learners. The laboratories are closed to learners at lunch time, unless a supervisor or teacher is present to minimise or prevent breakage, damage or thefts. IT tutors are responsible for maintaining the laboratories, although there are possibilities for external contracting in many areas (Maitlamo, 2004).

As can be seen from the foregoing, the use of ICT for learning in Botswana secondary schools in Botswana is still largely restricted and rudimentary. Maitlamo (2004) in a study of e-readiness of the education sector in Botswana noted that generally teachers and learners in secondary schools used computers as word processors to support traditional work, and in the production of papers and assignments. Teachers who used computers were generally proficient with word processing applications and could access information off-line from CD ROMs. In addition, teachers' basic computer literacy involved skills such as the use of the keyboard and mouse, basic understanding of the operating system, manipulation of files and cutting and pasting.

Botswana secondary school sector is providing ICT training to prepare teachers for the information age. The Mochudi Media Centre mentioned earlier provides in-service training, support and advice to schools ICT coordinators, computer integration teachers (CITs), schools senior management teams and education officers. The training programme prepares this cadre of staff to implement and sustain computer awareness and computer literacy programmes in junior and senior secondary schools (Maitlamo, 2004).

Additional teacher support for professional development is provided through a network of 12

education centres. These centres are located throughout the country to provide in-service activities. Other training programmes available for educators include the Internet Learning Trust (ILT) which builds on the government project by providing initial training and support for teachers in 11 junior secondary schools identified by the Ministry of Education as suitable pilot models. The project has piloted the use of the Internet for communication and enrichment of curriculum in pilot schools. Another project for IT training for teachers which began in the country in 2000 is being undertaken by World Links. The programme has been very successful and has expanded rapidly to include teachers from several schools; at least 15 junior secondary schools in urban centres and remote rural villages. Four major training events have taken place, and 15 school headmasters, 30 teacher coordinators and 100 teachers have been trained in the uses of ICTs in education at the school level (Maitlamo, 2004).

Though the Government of Botswana is making efforts to integrate ICT in secondary education, significant challenges remain to be overcome. A large percentage (estimated at 51%) of the population in Botswana lives in rural areas that have inadequate supporting infrastructure such as electricity and telephone. In addition, there is lack of high level IT skilled individuals within the country. The other challenge is limited broadband Internet access. Moreover, the costs of Internet access and computer equipment are prohibiting. Peoples (1999) enumerated costs associated with implementation of ICT in any education setting to include developing modules and courses online, developing learning materials, uploading time, communicating with participants, Internet access, and purchase of equipment. The challenges that affect integration of ICT in education are largely associated with what has come to be known as the digital divide phenomenon, which is discussed in the next section.

Digital Divide Factor in Secondary Education Sector in Botswana

The digital divide refers to the widening imbalances of access to ICTs between communities or countries. This imbalance has implications for equitable access to quality education in an electronic age. The digital divide limits the many uses and advantages that ICT brings in the education process or the classrooms. For example, modern schools now turn to information technology to create the learning environment that enables learners to be independent learners. ICTs, such as e-learning, can help learners to acquire knowledge and learn new skills, both in and out of the classroom. The implications are that those who do not have access to requisite ICTs fall much behind their counterparts that have access to such ICTs.

The causes of the digital divide have extensively been documented in ICT and related literature. The Digital Opportunity Task Force (2001) characterises the digital divide as a reflection of existing broader socio-economic inequalities caused by several factors such as insufficient infrastructure, high cost of access, inefficient telecommunication network, income level, geographic location, and political influence.

Schools are increasingly being seen as very important institutions for bridging the digital divide in society, because they represent focal points where many children from different communities converge for learning purposes. If schools are therefore well equipped with ICTs which can be shared, significant progress can be made in bridging the digital divide. Tomas Rivera Policy Institute (2002) points out that three learning environments can enhance digital literacy and help bridge the digital divide, namely: public schools, libraries, and community centres.

Becta (2003) discussing the impact of digital divide in education noted that there were several barriers to school use of ICTs, such as the lack of:

- ICT equipment and the cost of acquiring, using and maintaining them;
- Access to ICT equipment due to organisational factors, such as the deployment of computers in ICT suites rather than in classrooms;
- Technical, administrative and institutional support;
- Involvement of teachers, as well as managers in implementing change;
- Training differentiated according to the teachers existing ICT skill levels; and
- Training that focuses on integrating technology in classroom rather than simply teaching basic skills.

In Botswana, issues that impede effective use of technology include outdated computers; few computers compared to hundreds of learners; constant equipment malfunctions; inexpensive software more suited to recreational than educational uses of technology; lack of Internet access because of prohibitive costs; and limited supervision of learners. Moreover, most teachers lack skills, motivation and confidence that are crucial for the use of educational technologies.

The digital divide factor in Botswana in general is well exemplified by comparing the country digital opportunity index with the rest of countries in Southern Africa and beyond. The Digital Opportunity Index (DOI) is a good measure, and evaluates the opportunity, infrastructure and utilisation of ICTs in a country. DOI monitors recent technologies such as broadband and mobile Internet access, falling price of broadband, and increasing broadband speeds (World Information Society Report, 2006). The DOI for SADC member states for 2004/5 relative to global ranking is presented in table 1.

surveyed. In particular, Botswana presents very good opportunity to leverage ICT in many sectors of its economy, including education. However, infrastructure and overall ICT utilisation is poor. Infrastructures, especially telephone, PC penetration, Internet connectivity and electricity, are crucial in bridging the digital divide.

Similarly, an e-readiness assessment of Southern African member states in 2002 highlighted the challenges facing the region (SADC E-readiness Taskforce, 2002). Botswana was reported to be lagging behind South Africa, Mauritius and Seychelles, as far as personal computers (PC) penetration, Internet access, development of the banking infrastructure, content development, development of an ecommerce infrastructure and universal access were concerned.

The Information Literacy and Digital Divide Connection

The world over, one of the common barriers to the use of ICTs in education is associated with

Table 1: DOI for SADC member states (Number of countries ranked globally = 180)

Country	Opportunity 2004/5	Infrastructure 2004/5	Utilisation 2004/5	Digital opportunity index 2004/5	World ranking 2004/5
Angola	0.60	0.002	0.00	0.21	135
Botswana	0.92	0.12	0.01	0.35	102
DRC	0.46	0.05	0.00	0.16	150
Lesotho	0.65	0.03	0.00	0.23	133
Madagascar	0.38	0.01	0.00	0.13	162
Malawi	0.23	0.01	0.00	0.08	174
Mauritius	0.98	0.41	0.06	0.48	50
Mozambique	0.26	0.02	0.01	0.09	169
Namibia	0.85	0.10	0.01	0.32	109
Seychelles	0.97	0.32	0.10	0.46	54
South Africa	0.90	0.18	0.05	0.38	91
Swaziland	0.80	0.80	0.01	0.30	116
Tanzania	0.35	0.02	0.00	0.12	165
Zambia	0.39	0.01	0.00	0.13	160
Zimbabwe	0.42	0.05	0.03	0.17	149

From table 1, Botswana seems to do well in comparison to its counterparts within Southern Africa as far as DOI is concerned. However, when compared with other countries around the world, it emerges at position 102 out of 180 countries

information literacy in general and computer literacy in particular. The Association of College and Research Libraries (2003) defines information literacy as a set of abilities requiring individuals to recognise when information is needed and have the

ability to locate, evaluate and use effectively the information needed. The Clinton Era Technology Literacy Challenge programme equated technology literacy with computer skills and the ability to use computers and other technologies to improve learning, productivity and performance (U.S Department of Education, 1996).

The importance of information or computer literacy in education needs no emphasis. Proponents of computer literacy in education emphasise the need to provide learners with a complete set of computer skills and information on how computers are used and knowledge of their effects. Goodson and Mangan (1996:4) assert that computers will dominate the workplace of the future, and learners must therefore have some knowledge of how computers function, in order to be comfortable and competent in such a workplace. There is the other pedagogical argument that computer education is a worthwhile experience, as it encourages learning of formal logic and mathematics.

Becta (2003) outlined information literacy related barriers that affected integration of ICT in the classrooms. Such factors are associated with training skills; knowledge and computer experience; lack of self confidence; fear of embarrassment in front of pupils and colleagues; lack of knowledge necessary to enable teachers to resolve technical problems when they occurred; lack of training differentiated according to the teachers' existing ICT skill levels; as well as lack of training focusing on integrating technology in classroom rather than

to ICT being so minimal and sporadic, that typical learners were not assured of access to any school-based technological literacy initiatives. Albion (2004) noted that ICT was constantly changing, making it difficult to identify a consistent set of knowledge and skills that could constitute appropriate computer literacy.

In Botswana, lack of access to computers in schools is perceived as contributing negatively to the quality of learners being admitted to tertiary institutions for higher education. Within the job market in Botswana, Mutula (2005) observes that opinion is divided with some employers feeling that fresh graduates from the University of Botswana are not having the necessary competencies in such areas as information retrieval and information technology to fit into the job market. Employers are consequently demanding review of academic programmes, so that graduates can be fully ready to work without the need to be retrained when they are employed. The University however believes that learners exiting from secondary schools are ill-prepared for higher education in part, because of lack of early exposure to modern learning facilities including computers.

The University of Botswana in 2002/03 introduced General Education Courses (GECs) to among other things address lack of information literacy competencies among the freshers. Among the GECs being offered to freshers include several ICT related courses as shown in table 2 (University of Botswana, 2005:20).

Table 2: Selected IT related GECs offered to Freshers by the University of Botswana

Course code	Course title
GEC 121	Computing and information skills fundamentals I
GEC 122	Computing and information skills fundamentals II
GEC 221	Information management skills
GEC 222	Problem solving with spreadsheet
GEC 223	Web application skills
GEC 322	Multimedia information presentation skills

Source: University of Botswana, 2005-2006

simply teaching basic skills. Peck, Cuban and Kirkpatrick (2002) in a study of computer use in the classroom, attributed the low utilisation of ICTs in teaching to several factors such as learners' exposure

The Way Forward for Botswana

The SADC e-Readiness Task Force (2002), in a review and strategy of Southern African member states including Botswana, emphasised the role

played by primary, secondary and tertiary education as enablers for ICT instruction-based skills. The Task Force pointed out that tertiary education in Botswana needed to be developed at both local and regional levels, in order to foster and grow the ICT skills base within the region. Similarly, national educational policies needed to cover ICT literacy, including curricula reform. Furthermore, teaching needed to include additional training for teachers as a primary requirement.

For Botswana, the importance of stepping up efforts to ensure that all schools have adequate ICT infrastructure to facilitate access by all learners cannot be over-emphasised. The government needs to do more to introduce ICT into the whole school system as soon as possible, both as a subject and as a classroom and educational tool. Despite efforts being made by the government to integrate ICT in the school curriculum, this is limited to secondary schools, and primary schools are not currently involved. Similarly, only limited numbers of junior secondary schools have access to computers. A national education ICT policy would provide the requisite framework for the use of various technologies within secondary schools and the entire education system in Botswana. Similarly, differentiated training of teachers that take into account varying levels of computer experience and learning styles, as advocated by Becta (2003) is crucial.

For the digital divide to be narrowed in Botswana's education system, reliable and efficient supply of telecommunication services at an affordable cost is critical. The Government of Botswana could largely contribute to narrowing the digital divide in its secondary school system by enacting relevant and enabling policies. UNESCO (2003) noted that the successful use of ICT in education depended to a large extent on a supportive policy environment and framework at national level, in order to provide the necessary resources.

The other issue that affects the use of ICT in education is the problem of sustainability. In order to help pay for the upkeep of the computers, schools can be encouraged to open up their computer rooms to local communities and charge for courses in technology skills, for printing out documents or hosting e-mail accounts. Government should get involved to provide financial help or pass laws that can guarantee cut price for net access by schools. Similarly, partnerships could help to bridge the digital divide in Botswana's schools. For example, in Kenya, some schools partnered with counterparts in the UK, and benefited from donated computers (Wekesa, 2001).

Schools in Botswana could also help bridge the digital divide by having policies that integrate ICTs in the school daily programmes. Department of Education and Youth Affairs (2001) in Australia points out that school goals should necessarily seek to integrate information and communication technologies into their operations to improve learning, to offer flexible learning opportunities and to improve the efficiency of their business practices. Peck, Cuban, and Kirkpark (2002) noted that for technology infusion in schools to be won, a number of measures need to be undertaken, including: ensuring that all learners are computer and technology literate through learning basic technology skills, and offering improved educational resources, in order to increase student academic achievement.

Becta (2003) observed that the way to address the barriers associated with information literacy was to carry out further research, in order to understand better the issues involved, and how they can be resolved. Department of Education and Youth Affairs (2001) suggests areas of further research to include: identifying leading practice of professional development activities involving the use of ICT that impacts best on teachers and schools; the interrelationships between ICT and other factors, which impact upon the learning environment and learning outcomes. For novice teachers, it is prudent to teach them basic skills before addressing pedagogical integration of technology. It is also important to ensure that basic technologies are mastered and utilised before moving to apply sophisticated technologies. Woherem (1993) argued that ICT required skilled staff to run, upgrade, maintain and repair it. Similarly, Dwyer, et al. (1986) noted that to realise the opportunity to integrate computers in classrooms, a broadly conceived approach to educational change that integrated new technologies and curricula with new ideas about learning and teaching as well as with authentic forms

of assessment was needed. Moreover, implementing change in education needed to include changing teachers' practices and beliefs.

The resolution of information literacy barriers in the deployment and use of ICT in secondary schools in Botswana lies in enhancing access to the technology for teachers and pupils through various enabling efforts, be they of policy, institutional capacity, or of individual nature. Enabling universal access through the provision of ICT and other infrastructures such as telephones and electricity power supply to the whole population, especially in rural areas would immensely contribute to integration of ICT in the secondary education sector and the entire education system in Botswana.

Conclusion

This paper has discussed the efforts of the Government of Botswana to integrate ICT into secondary school system and the implications of the digital divide factor for information literacy. In particular, the authors have pointed out that several barriers are affecting successful infusion of ICT in the curriculum, and impacting negatively on information literacy in Botswana. Most of the barriers are associated with, among others, lack of skills to resolve technical problems when they occurred; costs associated with ICT implementations (such as costs for acquisition and maintenance); lack of access to ICT equipment, due to organisational factors such as restrictions to computer room; lack of technical, administrative and institutional support; and lack of training differentiated according to the teachers existing ICT skill levels.

Multi-pronged approaches to address the digital divide barrier in education in Botswana are critical in order to improve information literacy among learners. Such approaches include, among others, research to identify best practices of professional development activities involving the use of ICT that impact best on teachers and schools; ICT training that takes cognisance of varying levels of computer experience among teachers; ensuring that schools integrate ICT into their operations; a policy environment that mandates the use of ICT to improve learning in every subject in schools level; availability of technical support for teachers in the use of ICT; adequate access to ICT by both teachers and learners; and adequate funding from government.

References

Albion, P. (2004) EDU5472 Computing In Education. [Online]. Available at: Https://www.Usqonline.Com.Au/Courses/EDU5472_2004S2/ [Accessed 21 October 2004].

Association of College and Research Libraries. (2000). Information Literacy Competency Standards for Higher Education, Association of College and Research Libraries, American Library Association. [Online]. Available at:

Http://www.Ala.Org/Content/Navigationmenu/ACRL/Standards_And_Guidelines/Information_Literacy_Competency_Standards_For_Higher_Education.Htm [Accessed 4 September 2004].

Becta (2003) What Research Says About ICT and Initial Teacher Training? [Online]. Available at: Http://Www.Becta.Org.Uk/Research. [Accessed 4 September 2004].

Cathleen, N. (2004) No Access, No Use, No Impact: Snapshot Surveys of Educational

Technology in K-12. *Journal of Research on Technology in Education*, 36(1) 15.

Department of Education, Training and Youth Affairs (2001) Fifth Generation Distance Education. Higher Education Series, Report No. 40, Jun 2001, 1-8.

Digital Opportunity Task Force (2001) Digital Opportunities for All: Meeting the Challenge, Report of the Digital Opportunity Task Force Including the Genoa Plan of Action. [Online]. Available at: Http://www.Dotforce.Org/Reports/DOT_Force_Report_V_5.0h.Html. [Accessed 31 July 2002]

Goodson, I.F. And Mangan, J.M. (1996) Computer Literacy as Ideology. *British Journal of Sociology of Education*, 17(1) 65-79.

Laurillard, D. (1999) A Conversational Framework for Individual Learning Applied to the 'Learning Organisation' and the 'Learning Society'' *Systems Research and Behavioural Science*, 16: 113–122.

Levert, B. (2003) We're Poppin' for Math. Learning and Leading with Technology, 31(4) 20-23.

Linn, E. (1999) "Tomorrow's Jobs: How High-Tech Are They?" Equity Coalition. Ann Arbour, Michigan: University of Michigan School of Education.

Livingston, P. (2004) Laptops Unleashed: A Middle School Experience. *Learning and Leading with Technology*, 31(7) 12-15.

Maitlamo. (2004) ICT Sector Survey in Botswana. Report of National ICT Consultancy for Botswana. Gaborone: Consulting and Audit Canada, 1-68.

Mclaren, J. and Zappala, G. (2004) The Digital Divide among Financially Disadvantaged Families in Australia. [Online]. Available at: Http://www.Firstmonda.Dk/Issues/Issue7_11/Mclaren/Index.Html [Accessed 12 September 2004].

Mutula, S.M. (2005) Assessment of the E-Readiness of SMES in the ICT Sector in Botswana with Special Reference to Information Access [PhD], Information Science], University of Johannesburg, South Africa September 2005.

Peck, C. Cuban, L. And Kirkpatrick, H. (2002) High-Tech's High Hopes Meet Student Realities. *Education Digest*, 67 (8) 47-54.

Peoples, K. (1999) Online Learning: Seven Best-Practice Principles. The Australian *TAFE Teacher*, Aug., 10-12.

Presidential Task Group (1997) Long-Term Vision for Botswana: Towards Prosperity for All, Government Printer, Gaborone, p.6

SADC E-Readiness Task Force (2002) SADC E-Readiness Review and Strategy: Recommendations of the SADC E-Readiness Task Force. Gaborone: SADC.

Savery, J. R. and Duffy, T.M. (1995) Problem Based Learning: An Instructional Model and its Constructivist Framework. [Online]. Available At: Http://Crlt.Indiana.Edu/Publications/Duffy_Publ6.Pdf [Accessed 19 January 2006].

Tomas Rivera Policy Institute (2002) Information Technology, TRPI. [Online]. Available at: Http://www.Trpi.Org/Information_Tech.Html [Accessed 26 March 2003].

Toomey, R. (2001) Information and Communication Technology for Teaching and Learning, Schooling Issues Digest 2. Canberra: Department of Education, Training and Youth Affairs. [Online]. Available at: Http://www.Detya.Gov.Au/Schools/Publications/2001/Digest/Technology.Pdf [Accessed 5 October 2004]

UNESCO. (2003) Developing the ICT in Education Policy-Makers Toolkit: Issues and Rationale, Asia-Pacific Regional Bureau for Education. [Online]. Available at: Http:/www.Unesco bkk.Org/Education/Ict/V2/Info.Asp?Id=10985 [Accessed 5 September 2004].

University of Botswana (2005) University of Botswana Calendar 2005-2006. Gaborone, Public Affairs Department. University of Botswana.

University of Botswana (2005) University of Botswana Fact Book 2004/2005. [Online]. Available at: Http://www.Ub.Bw/About/Facts_And_Figures.Cfm [Accessed 17 January 2005].

U.S. Department of Education. (1996) Getting America's Learners Ready for the Twenty-First Century: Meeting the Technology Literacy Challenge: A Report to the Nation on Technology and Education. Washington D.C: Government Printing Office.

Wekesa, B. (2001) 73 Schools Benefit from British Council Project. East African Standard. Nairobi: Eastafrican.

Woherem, E. (1993) Information Technology in Africa. Nairobi: Africa Centre for Technology Studies (ACTS).

World Information Society Report (2006) Digital Opportunity Index 2005: World. [Online]. Available at: Http://www.Itu.Int/Osg/Spu/Publications/Worldinformationsociety/2006/World.Pdf [Accessed 13 February 2007].

WSIS (2003) World Summit on the Information Society: Draft Declaration of Principles [Online]. Available At: Http://www.Wsis-Pct-Org/Prepcom2-Declaration.Html [Accessed 7 November 2004].

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State of Information and Communication Technology (ICT) in Libraries in Rivers State, Nigeria

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Abstract

The study was designed to assess the current state of information and communications technologies (ICT) in libraries in Rivers State. The questionnaire method was adopted to collect and analyse data on a number of variables, and how they relate to the availability of ICT in libraries. The findings show that there is awareness of ICT in libraries in Rivers State, and that libraries are now more conscious of the need for maintenance agreements for ICT . ICT facilities in the libraries were found to be inadequate, which shows that the pace of ICT development in the libraries is still very slow. Insufficient funding is regarded the greatest obstacle to the implementation and utilisation of ICT followed by inadequate number of staff with ICT skills.

Introduction

Libraries have remained unchallenged, until recently, as providers of convenient and comprehensive information to meet a wide range of the information needs for the public. Libraries had been the sole gatekeepers of information (Pugh, 2000). The fifth law of library science according to Ranganathan (1963), is that the library is a growing organism. Growth must imply change and libraries are faced not only with an unprecedented rate of change, but also challenges to their existence in contemporary society (Weiner, 2003). There is evidence that prove that libraries in the more developed world are losing their users very fast. Fewer people are visiting the libraries than before, because what they used to go to the library for is now easily available elsewhere. Anybody with a computer can now go directly to an on-line service to locate, order and receive a copy of an article, without ever leaving his or her home (Estabrook, 2004). In order to retain their relevance in present day society, libraries have begun to offer services to their user communities, even outside the walls of libraries. There are now ubiquitous library or virtual/ digital libraries. These are libraries available anytime, anywhere. Libraries, especially in the developed world, are making their on-line library catalogue and databases available to their clients, outside their walls (Kaske,2004). Information and communication technology (ICT) has made this possible. Akintunde (2004) summed this up when he stated that:

> *Libraries, worldwide since the last two decades, have undergone significant metamorphosis-from a purely traditional modelled manual service delivery system to a more dynamic technologically driven system ... like a cyclone the technology driven environment has enveloped the library and is taking it to unprecedented heights in knowledge acquisition, management and communication.*

Akintunde's (2004) description of information and communication technology (ICT) is very apt at this moment. According to him, ICT is a terminology, which has overtaken information technology (IT), because of its appropriateness, and its utilitarianism. He further opined that whereas IT was the terminology used in the 80s and the 90s; (ICT) has taken over since then. While information technology

(IT) focused on the computer, (ICT) emphasises the use of technology for development, thus focusing on the use of computer and other technologies such as telephone to process, transport and transfer voice and other data singularly or mixed with least interference or distortion of content. It is this latter emphasis that has led to more interest on how services in the library can be repackaged to reach library users anytime, anywhere.

ICT Awareness by Library Operators in Nigeria

Information and communication technology (ICT) has become an important subject for all information providers such as, library workers. This is because of its relevance and applications to tasks in libraries and information centres. The question that comes to mind at this point in time is whether providers of information in Nigerian libraries are aware of this new technology.

The Nigerian Library Association (NLA) has left no stone unturned in its attempts to make library operators literate or at least be aware of information and communication technology by sponsoring conferences with themes that had to do with ICT. Well-articulated articles discussing ICT, such as Ikpaahindi, 1999; Daniel, 1999; Oketunji, et al, 2002; Aina, 2003, and Akintunde, 2004), have been presented at Nigerian Library Association Annual Conferences and General Meetings in the past few years. The different sections within the NLA, such as the *Cataloguing and Classification, Academic and Research Libraries* and *Information Technology* sections have been organising seminars and workshops for the same purpose. The NLA chapters in each state have also in the vanguard to making library operators not only to be aware, but also to see the need to embrace ICT in their libraries. The National Library of Nigeria has also been organising interactive seminars on the application and utilisation of ICT in different aspects of library operations.

On the African scene, Magara (2002) has provided a situation report on the state of ICT in Ugandan libraries. Kavulya (2004) also gave a picture of how some university libraries like the United States International University – Africa (USIU-A) and African Virtual University (AVU) are

promoting distance learning through the provision of online access to relevant collection centres for the students. The Botswana situation, especially as it relates to the University of Botswana was also reported by Ojedokun (2003).

Objective and Rationale of the Study

With all the above efforts, one would expect that library operators in Nigeria would have seen the need to have a strong ICT presence in their libraries. This is what this paper intends to find out among the libraries in Rivers State, Nigeria. This study has become very necessary, especially as none of the libraries in the state was listed among the libraries studied to determine the level of ICT use by the Oketunji, et al. (2002).

The general objective of this study therefore is to find out the present situation of ICT in libraries in Rivers State. Specifically, the study aims, to establish the number of computers, the existence of local area networks, the extent of automation and types of software in use, access to the Internet, number of professional and paraprofessional staff who are computer literate, and factors affecting the implementation and utilisation of ICT facilities.

Rivers State, one of the 36 states of the Federal Republic of Nigeria, is one of the oil rich coastal states located at the Eastern Niger Delta. Rivers State has twenty (20) good libraries. These include seven academic libraries, one research library, one public library and eleven special libraries.

Methodology

A social survey design method was employed for the study. Using the questionnaire as the instrument for the collection of data. The questionnaire was first tested on three libraries, to see if it was adequate. After necessary adjustments to the questionnaire as a result of the pre-test, the questionnaire was sent to the heads of all the recognised twenty libraries in Rivers State for completion. The questionnaire was administered in January 2007. After several visits to the libraries sixteen, (80%) of the copies of the questionnaire were retrieved, and consequently used for the analysis. The results are reported in simple percentages and averages in the tables below.

Analysis and Discussion

ICT Equipment

The types and number of ICT equipment available in these libraries is indicated in table 1. The first equipment type is the computer. From the content of this table, the sixteen libraries had a total of 127 personal computers. The number of computers per library ranged from 0 to 32, with an average of 8 computers per library. The number of computers per library was, however, highly skewed, because the two university libraries, which had a total of 56

Table I: ICT Facilities Available in the Libraries in Rivers State

S/No	Name of Library	Number of computer units	Local Network	Software in Use	Internet Access
1.	Catholic Institute of West Africa (CIWA) library, Port Harcourt.	8	Yes	Alice for Windows	Yes
2.	Centre for Advance Social Studies, (CASS) Library, Port Harcourt.	1	Yes	D-base Management CDS–ISIS	Yes
3.	Federal College of Education (Technical) Library, Omoku	5	Nil	Nil	Yes
4.	NNPC Refinery library, Eleme	5	Yes	D-base Management	Yes
5.	Nigerian Agip Oil Company (NOAC) Limited Library, Port Harcourt	4	Yes	D-base Management	Yes
6.	Rivers State College of Arts and Science Library, Port Harcourt.	1	Nil	Nil	Nil
7.	Rivers State College of Education Library, Port Harcourt.	5	Nil	Nil	Nil
8.	Rivers State College of Health Science and Technology Library, Port Harcourt.	Nil	Nil	Nil	Nil
9.	Rivers State House of Assembly Library, Port Harcourt.	10	Yes	Nil	Yes
10.	Rivers State Judiciary Library, Port Harcourt	3	Nil	Nil	Nil
11.	Rivers State Library Board, Port Harcourt.	6	Nil	Nil	Nil
12.	Rivers State Ministry of Justice Library, Port Harcourt.	Nil	Nil	Nil	Nil
13.	Rivers State Polytechnic Library, Bori	14	Yes	Library Manager	Nil
14.	Rivers State University of Science and Technology Library, Port Harcourt	32	Yes	Alice for Windows	Yes with Cybercafe
15.	SPDC Corporate Library – East A. I., Port Harcourt.	9	Yes	CDs-ISIS, D-base Management	Yes
16.	University of Port Harcourt Library, Port Harcourt	24	Yes		Yes

computers or approximately 44 per cent between them, while the other fourteen libraries had 71 computers or 56 per cent of the total number of computers. It is worthy to note that the library of the University of Science and Technology had 32 computers or approximately 25 per cent of all available computers.

The available numbers and distribution of computers in the libraries is clearly inadequate. The Rivers State University of Science and Technology, for instance, had a population of about 23,000 students as at 2006/2007 session, but a mere 32 computers in its library out of which, only 10 were available to the public. All the other tertiary' institutions have not fared better, and the public library's six computers are also grossly inadequate. The grossly inadequate computers show that the libraries were not adequately responding to the urgent need to provide ICT in their libraries.

Table 1 also shows that nine libraries out of the sixteen studied already had local area network (LAN) in place, which represents 56%. It is only when a LAN is in place that the computers within the library can communicate with one another, and for users to have access to materials, especially the On-line Public Access Catalogue (OPAC). More libraries should have LAN, in order for the facility to be fully utilised.

Also from table 1, it was discovered that seven out of the sixteen libraries investigated were using different library software. *D-base Management* seems to be very popular among the special libraries as four special libraries indicated using *D-base Management* software and two out of them indicated the use of *CDS-ISIS* in addition. *Alice for Windows* was used by two libraries while one library using *Library Management* software package. This shows that among seven libraries, four different types of software were in use. The implication is that online resource sharing would be difficult, as the software in use may not be compatible.

Internet Access

The study also sought to find out how many of the libraries already had Internet access in place. Table 1 again shows that only nine libraries (56%) had Internet access in their libraries. In the face of continuous dwindling of fund for libraries and high cost of printed resources, the Internet is desirable in any library, because of the vast resources it contains. The Internet affords the library access to a wide range of information resources for her users. If the library must remain relevant to her users and so to society, it must provide Internet access manned by capable hands to provide this all sine qua non service in the library. Fifty-six percent (56%) Internet readiness among the libraries studied is therefore not good enough.

Automated Services

Apart from looking at the software in use, the study also investigated the services that have been automated, as automation is part of ICT compliance. Table 2 shows that out of the sixteen libraries; only six had some form of automated services; four libraries had their acquisition procedure automated; six had circulation automated; four had their cataloguing automated; while three had their serials and reference services automated. The fact that only six (38%) of the libraries studied, had some form of automation shows that libraries in Rivers State are still shying away from automation. Library automation is a necessity, because of the benefit of increasing effectiveness and efficiency of performing basic data handling tasks in the library (Tiamiyu, 2000).

Inhibitors to ICT Use

An additional objective of this study was to find out what factors determine the provision and utilisation of ICT facilities in the libraries. Respondents were asked to rank a number of factors that affected ICT implementation by ranking each factor from 1-5 (1 being the highest constraint and 5 the least constraint). The mean of the 16 libraries for each factor was calculated. The lower the mean, the higher the constraint. Table 3 summarises the factors that affect the implementation of ICT. Inadequate funding was regarded as the highest factor affecting ICT provision. This was followed by inadequate number of staff with ICT skills, and irregular power supply. Other factors in a descending order were occasional breakdown of equipment, lack of technical support, lack of maintenance, and over population of users.

Table 2: Services Automated in the Libraries

S/N	Name of Library	Acquisition	Circulation	Cataloguing	Serials	Reference
1.	Catholic Institute of West Africa CIWA), PH	None	Yes	Yes	Yes	None
2.	Centre for Advance Social Studies, (CASS) PH.	None	None	None	None	None
3.	College of Education (Technical) Omoku	None	None	None	None	None
4.	NNPC Refinery Library Eleme	Yes	Yes	Yes	None	None
5.	Nigerian Agip Oil Company (NOAC) , PH	Yes	Yes	None	None	None
6.	Rivers State College of Arts and Science, PH.	None	None	None	None	None
7.	Rivers State College of Education, PH	None	None	None	None	None
8.	Rivers State College of Health Science and Technology, PH.	None	None	None	None	None
9.	Rivers State House of Assembly, PH	None	None	None	None	None
10.	Rivers State Judiciary, PH Harcourt	None	None	None	None	None
11.	Rivers State Library Board, PH	None	None	None	None	None
12.	Rivers State Ministry of Justice, PH	None	None	None	None	None
13.	Rivers State Polytechnic Bori	Yes	Yes	None	None	Yes
14.	Rivers State University of Science and Technology Port Harcourt	None	Yes	Yes	Yes	Yes
15.	University of Port Harcourt	None	None	None	None	None
16.	SPDC Corporate	Yes	Yes	Yes	Yes	Yes

It is not surprising that inadequate funding was regarded as the greatest obstacle to the implementation of ICT, because libraries' allocations in Nigeria have been dwindling since the late 1980s.

particularly from the period of the Structural Adjustment Programme (SAP). Even though SAP is no more, the fact remains that allocations to libraries are still dwindling. Since budgeting and the

Table 3: Factors Affecting Implementation and Utilisation of ICT Facilities

Factors	Average of Respondents Perception	Ranking
Inadequate Funding	1.5	1.0
Inadequate Number of Staff with ICT Skills	2.8	2.0
Irregular Power Supply	3.0	3.0
Occasional Breakdown	3.6	4.0
Lack of Technical Support	4.2	5.0
Lack of Maintenance	4.6	6.0
Over Population of Users	4.7	7.0

subsequent allocation of funds are essential for the success of any project, this study also directed its attention to it. The result of the inquiry shows that the major sources of funding for the libraries are government (Federal/State/ETF) and parent companies. Other sources of funding in some libraries were from the Mac Arthur Foundation, USA, and the fees paid by students. All the libraries indicated that they operated annual budgets. But when asked what percentage of the annual budget was allocated to ICT, only two indicated that they had special allocation for ICT. While the Rivers State University of Science Technology had 5% of its vote for ICT, Bori Polytechnic indicated that 20% of her budget was allocated to ICT.

A further investigation on lack of skilled human resources which came second as inhibitor to the implementation and utilisation of ICT revealed that out of the sixteen libraries , 39 of their staff (38%) were professional librarians, while 64 (62%) were paraprofessionals. Also, out of the professional staff, 35 or 89.1% were computer literate, while 30 or 46.9% of the paraprofessionals were computer literate. The librarians or professionals seem to have done better than the paraprofessional in the area of computer literacy. However, the fact that inadequate number of staff with ICT skills ranked second among the factors militating against ICT development in the libraries shows that the computer literacy of staff may not be ideal .It is very important that enough staff with adequate computer literacy be readily available, if any ICT programme in the library is to be successful.

The third inhibitor to ICT provision and utilisation, is irregular power supply, which is no news, because the whole nation, Nigeria, is affected by this factor. The reason it is ranking third position in Rivers State as against first position in other parts of Nigeria (Oketunji, et al. 2002) is because about half the libraries being studied are in the private sector, where electricity is generated and supplied by private companies.

Occasional systems breakdown came fourth among the factors affecting the implementation and utilisation of ICT. Breakdown could mean non-access to the Internet, due to ineffective Internet Service Provider (ISP) or breakdown of machines. For instance, in Rivers State University of Science

and Technology, efforts were made to take statistics of how often there was lack of access to the Internet from 21st August to 10th October 2006. There was a loss of a total of 21 days, due to ISP problems during the 41-day period. This shows that it is very important to shop around for the best Internet Service Provider (ISP) for effective provision of ICT in libraries. Those with broadband facilities are preferable.

Lack of technical support and lack of maintenance ranked low, because libraries are now attaching more importance to maintenance of equipment. This they have done by having maintenance agreement with equipment suppliers or by employing maintenance engineers in the libraries.

Conclusion and Recommendations

The findings of this study are quite revealing and incisive. First, the number of computers in the libraries was low, averaging 8 computers per institute/organisation. Furthermore, the number of computers was highly skewed in favour of the two universities that housed 44 per cent of the 127 computers. This may be because many of the senior staff of the private organisations included in this study had their personal laptops, and therefore hardly need to use the facilities in their libraries. The automation of critical services in the libraries is also minimal, and most of the staff were inadequate in ICT skills.

The study also identified the major factors militating against the establishment and management of an effective ICT in the libraries. These impediments ranged from inadequate funding, to inadequate number of staff and expertise, followed by irregular power supply. Only two of the sixteen libraries made specific allocation to ICT in their budgets. One librarian questioned the need to allocate fund for ICT development, when hey had not been able to buy books for some time now. This shows the level of ignorance of the advantages that could be derived from ICT It is cheaper to purchase the electronic versions of some of these books, especially the reference materials, than purchasing the printed version, and ICT also provides the opportunity of downloading many free materials from the Internet.

In the light of the above, several recommendations are proposed. First, librarians should allocate reasonable percentages of their allocation to ICT development, no matter how small the total library budget is. Education Trust Fund (ETF) allocation can also assist in this area. Libraries of academic institutions, may also charge library fees. Libraries could also solicit for fund from organisation and individuals, through good proposals for specific ICT projects. Another recommendation is that the competency in the ICT skills of staff should be vigorously pursued through exposure to regular training workshops.

References

The African Digital Library http://www.africa education.org/adl

Agboola, A. T (2000) Users' reaction to two CD-ROM Databases in Nigeria University Library *NLISR*. .18 (1&2)18-29

Aina, L. O. (2004) Library and Information Science Text for Africa. Ibadan: Third World Information Services Ltd, p.312

Aina, L. O. (2003) *Strengthening Information Provision in Nigerian University Libraries: The Digital option*. Paper presented at the 41st National Annual Conference and AGM, Makurdi.

Akintude, S. A. (2004) *Libraries as Tools for ICT Development*. Paper presented at the 42nd Annual National Conference and AGM of the NLA, Akure.

Akintunde, S. A. (2006) State of ICTs in Tertiary Institutions in Nigeria: Windows on the Universities. In: *Libraries: Dynamic Engines for Knowledge and Information Society* Proceedings of NLA Annual National Conference and AGM, Abuja. pp.123 - 137

Daniel, J. O. (1999) *The Role of Information Service in a Democratic Culture*. Paper presented at the 1999 Annual Conference and A.GM of the NLA, Port Harcourt.

Estabrook, L. S. (2004) *The Changing Role of Libraries* in Encyclopaedia Britannica, Deluxe Edition, CD.

Faboyinde, E. O. (2006) The State of Information and Communication Technology (ICT) in Selected Libraries in Lagos and Ibadan and Ibadan Metropolis. In: *Libraries: Dynamic Engines for the Knowledge and Information Society* Proceedings of the NLA 44th Annual National Conference and AGM, Abuja, pp.61 – 68.

Horne, A. K and Kristensen T.C. (2004) The Development of Mycontents, An Enriched Electronic Tables of Contents Services. *Portal: Libraries and the Academy,.*4 (2) 205 – 218.

Idiegbayan-Ose, J; Okosun, H. E; Eruanga, C; and Ojo-Igbinoba, M.E. (2005) *Ben Idahosa University Virtual Library: A Case Study.* NLA 43rd Annual National Conference and A.G.M pp.51 – 60

Ikpaahindi, L. N. (1999) *Essential Knowledge Base for Information Science and Technology Librarians in a Democratic Culture.* Paper presented at the 1999 Annual National Conference and A.GM of the N.L.A., Port Harcourt.

Kavulya, J. M. (2004) Challenges in the Provision of Library Services for Distance Education: A Case of Selected Universities in Kenya. *African Journal of Library, Archives and Information Science,* 13 (1) 43-53.

Magara, E. (2002) Application of Digital Libraries and Electronic Technology in Uganda. *African Journal of Library, Archives and Information Science,* 13 Vol.(2)145 – 154.

Obasuyi, L. (2005) *Impact of Computer and Internet Applications on Library and Information Services Delivery in NARIS Libraries in Nigeria.* NLA 43rd Annual National Conference and AGM, pp.76-86.

Ogunleye, G. O. (1997) Automating the Federal University Libraries in Nigeria: A State of the Art . *African Journal of Library, Archives and Information Science,* 7 (1)71 – 79.

Ojedokun, A. A. and Owolabi, E. O (2003) Internet Access Competence and the Use Internet for Teaching and Research Activities by University of Botswana Academic Staff. *African Journal of Library, Archives and Information Science,* 13 (1) 43 – 53.

Oketunji,I.; Daniel, J.O; Okojie, V.O.;Abdulsalam,R. (2002) *40 Years of Information and Communication Technology (ICT) Library Services to the Nation* . Paper presented at the 40th Annual National Conference and AGM of the NLA, Badagary.

Popoola, S. O and Gold, I. D. (2001) Microcomputers Utilisation and Vendors' Support Services to Libraries in Lagos, Nigeria. *NLISR* 19(1-2)7 – 16

Pugh, L. (2000) *Change Management in Information Service*. 2nd ed. Aldershot England: Gower p.13.

Ranganathan, S. R. (1963) *The Five Laws of Library Science*. 2nd ed. New York: Asia Publ. House p.326.

Sanni G. A. and Idiodi, E. A. (2004) Library Computerization at the University of Benin, Nigeria. *African Journal of Library, Archives and Information Science*, 14 (1) 65 – 76

Tiamiyu, M. U. Developing Automated Library Systems and Strategies. In Library Automation for the Information Age (Concepts, Technologies and Strategies) edited by Bisi Ajibola and Muta Tiamiyu, Ibadan: CLIP, 2000. Pp.63 – 79.

Weiner, S. G. (2003) Resistance to Change in Libraries: Application of Communication Theories. *Portal: Libraries and the Academy* 3 (1) 69 – 78.

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The Role of Libraries in Information Dissemination for Conflict Resolution, Peace Promotion and Reconciliation

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Abstract

Man has continues to live in a world in which the prospects for universal and continuous peace and security remain dark with a plethora of global conflicts involving nations. Consequently, the themes of war, conflict resolution and peace promotion have dominated social science discourse, particularly in sociology, political science and international relations. As a result, peace and conflict research has become one of the cardinal pursuits of human societies and communities. What has remained, in all of this development, is the role of library in disseminating information for conflict resolution. The study highlights various strategies for conflict resolution, causes of conflict, consequences of conflict, information and conflict resolution, conflict resolution through information literacy and library, and conflict resolution. It concludes that libraries have many challenges in meeting up with conflict resolution. Such challenges include inadequate or lack of well equipped ICT laboratories, inadequate funding, inadequate number and right calibre of academic staff, and irregular power from the public power supply.

Introduction

The establishment of the United Nations in San Francisco in 1945 (after World War II) was the result of a desire to save succeeding generations of mankind from any major war of global dimension. The architects of this global body desired to work together to prevent the outbreak of new global conflict, as well as build a world of freedom, progress, prosperity and justice for all nations (UN, 2001).

Conflict affects countries at all levels of economic development, but its disproportionate affects least developed countries or countries in economic stagnation. Conflicts vary widely in their nature, extent, duration, range of contributory factors, and the ways in which they impact education. Using the Uppsala data set of armed conflict 1946-2001, the study identified 52 countries or territories that have been affected by war or intermediate conflict since 1990 (World Bank, 2005) and most of these are in Africa.

Conflict can be seen as a situation in which two or more human beings desire goals, which they perceive as being obtainable by one or the other, but not both. This compact definition can be opened up and clarified by saying that there must be at least two parties; one party in mobilizing energy to obtain a goal, a desired objecting or situation, and the other party perceives the other as a barrier or threat to that goal..." quoted in(Michael,1981). From the above definition, conflict resolution is a post conflict negotiation that ends in peaceful agreements.

Collette, et al. (2003) are of the view that shortening conflicts might seem to be the most effective way of building a more peaceful world. However, in isolation such an approach is less effective than it might appear; unless post conflict risks are reduced. Shortening the duration of conflict. This, is of course, worth achieving ,but it should be seen as only part of a broader strategy for conflict reduction.

Montville, writing for the UN (1992), defined two distinct, mutually supportive components of conflict resolution as:

"Training in dispute resolution skills, and political conflict resolution- processes. The widely used negotiation mediation- conciliation approach, concentrated on problem –solving through consensus- building so that the basic interests of all parties could be satisfied; on the other hand, the litigation or power negotiation approach promoted discord, since the "power" side wins while the weak side loses and is determined to seek revenge in the future. Negotiating skills were critically important, and could help resolve deep-rooted ethnic and sectarian conflicts. In fact, conflict resolution could support the evolution of democratic pluralism in civil society."

Although there is still no consensus on the best strategies for conflict resolution, practitioners, however, agree on the goal of conflict resolution: to move from power-base relations and "win-lose" approaches to conflict, towards the facilitation of communication, confidence-building, problem-solving, voluntary agreement and "win-win" situations. From the above, one can see that researchers have thought about negotiation–mediation-conciliation approaches, including withholding of finance, training in dispute resolution, building positive relationships, etc. as ways of resolving conflict. But none has mentioned information dissemination as a way of resolving conflict. This then is the focus of this study: to explore the different ways libraries can be used to resolve conflict.

In March 2000, UN Secretary-General Kofi Annan set up an independent panel to make a clear set of recommendations on how to do better in future in the whole range of United Nations activities in the area of peace and security. Brahimi, Bakhdar (1998), (cited in UN 2003), the former Algerian Foreign Minister in his Report released on 23 August had observed that:

"Without renewed commitment on the part of member states, significant institution change and increased financial support, the United Nations would not be capable of executing the critical peacekeeping and peace-building tasks that are at core of its mission: "to save succeeding generations from the scourge of war."

The United Nations and its members face a pressing need to establish more effective strategies for conflict prevention. Furthermore, the organisation would continue to face the challenges of having to assist communities and nations in making the transition from war to peace. Conflicts in Africa pose major challenges to the United Nations efforts towards global peace, prosperity and human rights for all. These conflicts, the main aim, increasingly, is the destruction, not just of armies, but of civilians and entire ethnic groups. Preventing such war is no longer a matter of defending states or protecting allies. It is a matter of defending humanity itself (UN, 1998). Since 1970, more than 30 wars have been fought in Africa, the vast majority of them are intra-state. In 1996 alone, 14 of the 53 countries of Africa were afflicted by armed conflicts, accounting for more than half of all war related deaths world wide and resulting in more than 8 million refugees, returnees and displaced persons. However, one believes that some of these conflicts would have been avoided, if there were adequate communication among the warring communities and peace makers before the conflicts broke out. In other words, if there were information channels that are open to everybody, then the conflict would have been contained. Information could be defined as a stimulus that reduces uncertainty and denotes the knowledge communicated, concerning some particular facts subjects or events (Laloo, 2002).

Causes of Conflict

More than three decades after African countries gained their independence; there is a growing recognition among Africans themselves that the continent must look beyond its colonial past for the causes of current conflicts. The major factors identified are political, external, economic motive, and ethnic and religious in nature.

Political Factors

The nature of political power in many African nations, together with the real and perceived consequences of capturing and maintaining power, is a key source of conflict across the continent. It is frequently the case that political victory assumes a winner-takes- all form with respect to wealth and

resources patronage, and prestige and prerogatives of office (UN, 1998). Anatolii Karpou, President, Informational Peace Foundation said that "The cause of conflicts in the commonwealth of independent states was, for the most part, not ethnicity but political power. For example, while there was no personal hostility between the people of Georgia and Azerbaijan, they struggled for authority to govern territory" (UN, 1991).

External Factors

During the cold war, external efforts to bolster or undermine African governments were a familiar feature of super-power competition. With the end of the cold war, external intervention has diminished but has not disappeared. In the competition for oil and other precious resources in Africa, interests external to Africa continue to play a large and sometimes decisive role, both in suppressing conflict and in sustaining it. Foreign interventions are not limited, however, to sources beyond Africa. For example, during Sierra Leone civil war, Charles Taylor was interfering by supplying arms and fighters to rebels in exchange for diamond. Likewise, Britain supplied arms to Nigeria against the Biafran rebels during the Nigerian-Biafra crisis (Okeke, 1968).

Economic Factors

Despite the devastation that armed conflicts bring, there are many who profit from chaos and lack of accountability, and who may have little or no interest in stopping a conflict and much interest in prolonging it. Very high on the list of those who profit from conflict in Africa are international arms merchants. Also high on the list, usually are the protagonists themselves (UN, 1998). In Liberia for instance, the control and exploitation of diamonds, timber, and other raw materials was one of the principal objectives of the warning factions. Control over these resources financed the various factors and gave them means to sustain the conflict. In addition to the broader sources of conflict that have been identified, a number of other factors are especially important in particular situations and sub regions which include government policies, development patterns, ethnic/ religious factors, and inadequate information dissemination.

Government Policy

The first root cause of war was that most governments used models of economic development that hurt the poor. Such polices had been implemented in countries such as Zimbabwe and the United States, widening the income gap between the rich and the poor. Another important cause of war was the growing intolerance for diversity, especially by people in power. For example, Echezona (2001) explained that the policy of redistributing white owned-lands in Zimbabwe could be a political game play by Robert Mugabe to get rural farmers on his side and, at the same time, a pragmatic policy to "right the wrongs of the past". Whichever way it is, the success of such a venture has been hinged on international goodwill, which has, however, allied itself to popular opposition forces against Mugabe. Zimbabwe has since been mired in economic cornucopia, a situation that has arisen due to possible incorrect approaches to development and pressures from donors and foreign concerns. Another example is the transition to civil rule policy of the Babangida regime in Nigeria, which came to an impasse with the annulment of the June 12, 1993 election, that the SDP (Social Democratic party) Presidential candidate, MKO Abiola, was poised to win. Consequently, there was conflict on the street, and eventual loss of lives.

Information Flow and Sharing

Recent studies have noted that lack of adequate or balanced information was the most significant cause of most of the violent conflicts. This seems to be true because without knowledge and information, there is likely to be a conflict. The African continent, witnessed the introduction of "genocide" in the African lexicon in Rwanda in 1994, and evidence points to the negative role of the mass media, especially Radio Miles Colines, in preparing the minds of Hutus against Tutsis. As the apparatus of the Hutu State, the radio station tried to portray Tutsis as demons that must be exterminated from the face of the earth, and in an attempt to wipe the Tutsis out, Hutus themselves suffered one of the worst refugee crises on the African continent (Nnaji, 2001).

Development Patterns

Recent research also shows that development patterns that worsen inequalities, deepen poverty, or slash at the ties that bind societies together –can themselves contribute to the likelihood of conflict and its haunting recurrence (World Bank, 2005). Conflict, which has also been conceptualised as: "development in reverse," should be analysed in the context of its impact on development (World Bank, 2003), when a development pattern does not make for equity, fairness and justice, it is bound to bring conflict. For example, in the Niger Delta region of Nigeria, there were series of conflicts, ranging from riots, rampage, kidnapping to murder because the people of the region claimed that the resources that were exploited from their land were not used to enrich them economically or socially, or politically.

Ethnic/Religious Factors

Ethnic or religious dominance rather than diversity is also a powerful contributory factor in civil conflicts. Egwu, et al. (2003) in his study on the communal conflicts in Zango Kataf explained that what started as communal crisis between the Hausa and Kataf assumed a religious dimension, when it spread to other towns in Northern Nigeria. He notes that two issues arise from the Zango-Kataf conflict: the need to develop a system of early warning signals, and the challenge of peace-building and consolidation. The consequences are that there was a lack of coordination among the security agencies in the area of information sharing and collaboration aimed at nipping the conflict in the bud. What the situation suggests is that government should, based on the potentially recurrent nature of the crisis, develop an early warning system signals that can carefully anticipate and warn of the outbreak of communal violence.

Consequences of Conflict

Africans have witnessed many civil wars to date: the Liberian internal crisis, the Angolan civil war, the Sierra-Leone political internal strife under Mobutu, in the former Zaire (now Democratic of Republic of Congo –DRC), and the Nigeria-Biafra war, among others. These countries have witnessed negative consequences such as poverty and displacement.. A former defunct OAU Secretary General has this to say:

Conflicts have cast a dark shadow over the prospects for a united, secure and prosperous Africa which we seek to create— conflicts have caused immense suffering to our people, and in the worst case, death. Men, women and children have been uprooted, dispossessed, deprived of their means of livelihood and thrown into exile as refugees as a result of conflicts…. Conflicts have engendered hate and division among our people and undermined the prospects of the long term stability and unity of our countries and Africa as a whole." Quoted in (Deng, et al. 1996).

Conflict and poverty are intricately interrelated. It retards economic and social developments and may be conceptualised as "development in reverse" (World Bank, 2003).

In Central Africa, the consequences include the competition for scarce land and water resources in densely populated areas. In Rwanda, for example, multiple waves of displacement have resulted in situation where several families often claim rights to the same piece of land.

Information Dissemination and Conflict Resolution

Information dissemination or communication has been described as a need comparable with other basic human needs. Free flow of information is a right of the people which enables them to participate effectively in the process of economic, social and political activities in the society, and enhances education, knowledge and learning (Laloo, 2002). Therefore, for any nation to make meaningful impact in conflict prevention, peace promotion and conflict resolution, early warning information is needed. Timely alert to potential conflicts is central to an early warning system which, in order to be meaningful, must be complemented by early political action. Such alertness underlines the predictive capability of any early warning system. To that extent, therefore, early warning should not be seen as an end in itself, but rather, as a tool for preparedness, prevention and mitigation of conflicts, the efficiency of which is predicated upon a clear methodology for data collection, analysis and information exchange (Ibok and Nhara, quoted in

Yaqub, 2001). Early warning information should be facts on the matter. Some of this early warning information, which could include internet, community radio, television, video conferencing and voice over of Internet protocol (Volp), email, print media, and reference services, are important, in order for people to know the implications of embarking on the conflict. This information can be given first to those who can take constructive action. This generally means government and groups likely to be immediately involved in efforts to prevent the crisis such as the United Nations, UN Security Council, religious and media organizations. The implications could be in the following areas:

Economic Implication

Information dissemination is needed on the potential shortages, production problems, fiscal policies. that affect a larger proportion of the population in a given conflict. A nation about to indulge in a conflict, especially such that could lead to war and all the diverse problems that go with it, should be forewarned by the intelligentsia and information specialists. Of all the economic implications it is bound to cause the people such as shortages of food, water, electricity and money, etc. For instance , during Nigeria- Biafra war, Ojukwu warned the people of the State of Biafra that going to war will not be an easy task and that even the grass will suffer. The people need to know about these because they are bound to affect the people forcing to retreat or surrender.

Effective information management should be able to inform any nation about to indulge in conflict that sustained conflicts lead to armed struggle. In prolonged conflicts, warring parties often use dangerous weapons that produce substances that are inimical to human health and the environmental and produce air and water pollution, aquatic destruction and oil spillages. A study carried out on the Niger Delta by Ifidon and Ahiauzu (2005) revealed that the local communities lack information about the term of agreement between the federal government and oil companies about development activities and compensation from oil companies, and about the agreements between the oil companies and the representative of the local communities. Likewise, the conflict that broke in Bayelsa State in Nigeria

between Ijaws and the Federal Government of Nigeria was caused by environmental degradation. The end result, which brought about, firstly, the murder of policemen who came to make peace in the town, and subsequently to the total destruction of Odi land (Echezona, 2001). Effective information dissemination through libraries and the Internet will put the leaders and the people at alert on facts of potential and conflicts, including their causes, evolution, consequences and solutions.

Information also needs to be disseminated on unemployment and under-employment in all nations and communities. A hungry man and the idle hand is a devil's workshop. Jobless youths have to be informed about the national economic situation, availability of job, and ways of being self employed, without which they would be easy prey to temptations to dangerous life styles and crime which can lead to health problems, social malice, disorientation of young people, prostitution, poverty and death.

A constant assessment should be made of domestic political environments of member's countries and information should be provided in order to gauge the state of democratic practice and respect of the rule of law and the level of adherence to political and human rights. Without adequate information, people are bound to struggle for power or natural resources, etc, which invariably leads conflict, hardship and death. For example, successive governments in Nigeria had refused to honour the agreement reached by Yakubu Gowon of Nigeria and Ahmadu Ahidjo of Cameroon during the Nigeria-Biafra war (1967-1970) concerning the Bakassi Peninsula, which led to the Bakassi conflict that displaced people, claimed lives, and property before it was resolved by the World Court, the UN an the two countries.

Personal Insecurity

People feel insecure, especially in urban areas, where the killings by armed robbers of innocent citizens and even policemen on duty occur on a daily basis. These acts, in the absence of adequate information may engender hatred, frustration and protest from the governed, who are bound to take laws into their hands, because they believe that state can no longer guarantee their safety.

Rural Indicator

Effective information gathering and dissemination at the grassroots level helps to douse inter and intra communal strife, religious crises, the morass of conflict between border towns, villages, and even one countries. It is therefore becomes imperative that a constant information must be given to the people, in order to maintain tranquillity. Community radio can be used to disseminate information to the rural people to alert them of impending crises. Information could be repackaged in a language the rural people can understand, and such information could also be disseminated cinema, drama, cartoons, and music.

Nigerian governments and the oil companies have so far been unable to resolve conflicts in the Niger Delta region despite at least nine significant initiatives between 1958 and 2003 to understand conflicts in the area. The initiatives includes: Willink' Commission (1958); Niger-Delta Development Board (1960); Niger-Delta Basin Development Authority (1997); Presidential Task Force (1980); the Belgore Commission (1993); the Nigeria-Delta Development Commission (2000); and the abolition of the on-shore/off-shore dichotomy (2003) (Fekemos, study quoted in Ifidon and Ahiazu (2005). All these commissions were constituted to identify, discuss and come out with findings. As one can see, the discussion, meetings and findings are all information, which can be used to resolve conflicts. Community radio, television, cartoon can be used to alert, inform or resolve conflict in a rural area, while digital information systems such as email, internet chat, web contact, video conferencing, list serve, etc. could be used to resolve conflict.

Conflict Resolution and Information Literacy

Information literacy is the ability to develop skills, in order to access, decode and use information. Such skills are essential in a growing and complex information society. Literacy in the information society also requires new mental and operational capabilities, enable a person to deal successfully with a highly fluid, evasive and yet strongly structured environment. Information literacy or lack of it is perhaps the most crucial facet of the so- called digital divide (Queau, 2001). The American Library Association defines it as a term "applied to the skills of information problem- solving ,and adds that an information- literate person "must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information"(American Library Association,1996), Hawkins (2002), notes that knowledge and information have become the most important currency for productivity, competitiveness, and increased wealth and prosperity. According to Akintunde (2004), ICT "emphasises the use of the computer and other technologies such as telephone to process, transport, and transfer voice and other data singularly or mixed with least interference or distortion of content." With the above definition, ICT can be used to either propagate or resolve conflict. For instance, the Nazis had made an immense use of the mass media in the Second World War to mobilize the German people (Nnaji,2001).

Libraries and Conflict Resolution

Historically, libraries and librarians have played a major role in creating, accumulating, organising, and disseminating information. Libraries are key players in fostering the information society. The advance in the area of computer hardware and software, as well as breakthrough in the field of communications, brought about a great revolution in the way libraries deliver their information service today. With this revolution of ICT systems such as internet, website, email, teleconferencing, and information super high way, etc, libraries can then play a role in conflict resolution. Libraries can have a web site on conflict resolution to reach potential users, NGO and Government. Internet- based services are a more recent introduction, but already, demands for the services are expanding quickly. Library can do that through the creation of a website, where adequate information on conflict resolution can be discussed, accessed and disseminated to a wider population through email, list serve and teleconferencing. Such information dissemination is needed, in order to succeed with any meaningful conflict resolution or reconciliation.

Eyitayo (2005) has noted that the advent of ICT has provided a bridge for the virtual library patrons, who may be in the comfort of their offices

or rooms and in dire need of answers to their questions. In order to remain relevant to this new environment, the library needs to pursue with all vigour the provision of online reference services. This type of service has been referred to as "chat," "digital", "email", "online", or "virtual" referencing service. Library and information services are key actors in providing unhindered access to essential information resources for economic and cultural advancement. In doing so, they contribute effectively to the development and maintenance of intellectual freedom, democratic values, peace and universal civil right (IFLA, 2002). Libraries can clearly play a major role in conflict resolution in the following ways:

Seminar

Ogunkelu (2001) stated that seminars would go a long way in equipping researchers in the techniques of identifying and preventing conflicts at their early stages, as well as manage and resolve them. The library could invite experts on conflict resolution as resource persons and provide them with information materials to back up their discussions. The transcripts of the discussions could be put into pamphlets or on tapes. Reports have shown that countries like Ethiopia, Namibia, Uganda, Somalia and Liberia have mobilised library community resources in innovative ways to prevent and resolve conflicts (World Bank, 1996), cited in World Bank,(2005). Libraries could also organise seminars not only for the purpose of building the capacity of conflict researchers, but also for conscientising members of the public on the importance of peace for meaningful development.

Extension Services and Indigenous Knowledge Systems

Libraries increase the value of human intellectual outputs by enhancing access to them through professional information processing, storage and dissemination functions. Public libraries have a solid tradition of outreach. This outreach means taking the library to the people (mobile libraries), so that they would read to illiterates in their communities,

translate, interpret, photocopy, ask, and answer questions concerning human rights, causes and consequences of war and other relevant information. Invariably, this information would help to prevent conflicts and wars (Population Reference Bureau, 2004).

Library in Collaboration with NGO

Saunder's study, (quoted in UN, 2002), suggested five ways to broaden theories of international relations to include not only state and governmental interaction, but also many interaction, that take place within body' politics. He also stated that "many conflicts such as those arising from identities or differing views of history were not suitable for governmental mediation, but were best handled by NGO's and libraries". Personnel from these organisations have visited communities, schools, to give lessons, stimulate discussion, and encourage children and adult in the simple steps to promote peace and resolve conflict. The United Nations has been deeply involved in many of these advances by supporting peace promotion and conflict resolution through sending their publications to the depository libraries all over the world, which the depository libraries invariable made accessible to their clients.

Access to free Information

By delivering high quality services, libraries and information centres have contributed immensely to ensure access to information. Libraries have allowed their users to have access to these resources in different formats, like CD-ROM, audiovisual and online. Libraries can also document and index books, magazines and newspapers that dealt on how conflicts can be resolved; and can inform their client communities about such information. The library could also provide information using audio-visual materials to the less educated and less privileged individuals so, that they can benefit and understand easily from the discussions (Fayose, 1995). Sturges & Chimesu (1996), are also of the view that essential information in books that dealt with peace and security may be repackaged and played to the hearing of all those meant to benefit from the content.

Conclusion

The development of any nation is undoubtedly impossible in an environment of crises, political instability and insurrection. It therefore becomes imperative for African nations to make meaningful effort in conflict prevention which is a necessary corollary for peace, development and good governance. Everybody therefore has a collective responsibility to help African nations and communities to foster peace and resolve conflicts. Community based organisations could be encouraged to constantly meet, process, review and monitor progress and implementation of information dissemination that would foster peace, and libraries have important role to play in identifying, collating and enhancing access to information for peace making and conflict resolution..

Security agencies also need to redirect their focus from military intervention to early warning information gathering. Peace promotion and conflict resolution cannot be achieved through establishment of permanent standing army, but it can be achieved through information gathering and dissemination.

References

Akintude, S.A (2000) New and Emerging Tools for Library Practice in the New Millennium. *Lagos Journal of Library and Information Science*. Vol. 1, (1).67-72.

American Library Association (1996) Position Statement on Information Literacy .Chicago: American Association of School Librarians.

Collette et al. (1996) The Transition From War to Peace in Sub-Saharan African. Washington D.C: World Bank, pp.31-40

Colette et al. (200) Bank Engagement after Conflict: A Client Perspective. A Background Document For The Post-Conflict Workshop in Maputo, July 17-18. Washington D. C: World Bank, p.23

Deng, M.F et al. (1995) Sovereignty as Responsibility Conflict Management in Africa.

Echezona, N. (2001). Regional and International Dimensions in the Use of Early Warning Mechanism for Conflict Prevention/ Management in Africa. International Conference

Held in Abuja. 18th -19th July, 2001. Unpublished.

Egwu, S., Salihu, A. and Kure, E. (2003) Communal Conflict and Population Displacement in Zango-Kataf. In: Nnoli, O (Ed). Communal Conflict in Nigeria: A Research Report.-Enugu: SNAAP Press, pp.79-112

Eyitayo, S.A (2005) Current Trends in the Utilization of ICT for Reference Services in Libraries and Information Centres. Paper Presented at the 2005 National Interactive Library Seminar On Application and Utilization. Unpublished.

Fayose, P.O., (1995) Nigerian Children's Literature in English. Enugu: PENL EDUCATION.pp.23-40

Fukuyama, F. (1989) The End of History .National Interest (1) 9

Hawkins, R.I. (2004) Ten Lessons for Information and Communications Technology in Developing World. Washington, D.C: World Bank, pp .4-9

Ifidon, S.E. and Ahiauzu, B, (2005) Information and Conflict Prevention in the Niger-Delta of Nigeria. *African Journal of Library, Archives and Information Science*, 15, (2)125-132

IFLA, (2001) The Role of Libraries in Fostering the Information Society. (Http://www.Ifla.Org/Iii/Wsis/Wsis-Lugano)

Laloo, B. T (2002) Information Needs, Information Seeking Behaviour and Users. New Delhi: ESS Publication.pp.3-5.

Mitchell, C. R (1981) The Structure of International Conflict" London: The Macmillan Press Ltd. 120p.

Nnaji Obinwa (2001) Conflict Prevention: The Role of the Intelligence Information Gathering and The Media in Early Warning System in Africa. Paper Presented at an International Seminar on Conflict Indicators and Early Warning Mechanism in Africa Held in Abuja, July 18-2001.Unpublished.

Ogunkelu, B. (2000). An Address Presented at the International Seminar on Conflict Held in Abuja, July 18th 2001. Unpublished.

Okeke, G.C. (1968) The Biafra- Nigeria War: A Human Tragedy. London: Ferment, p. 22

Otite, O. (1999) On Conflicts, their Management Resolution and Transformation In: Otite, O. and

Albert, L. (Eds.) *Community Conflicts in Nigeria: Management, Resolution and Transformation.* Ibadan: Spectrum Book Ltd. pp.1-32.

Population Reference Bureau (2004) Preventing Cervical Cancer Worldwide. Washington D.C: PRB, pp3-7.

Queau, P (2001) Information Literacy: A New Frontier. *UNISIST Newsletter.* Vol.29 (2) 3.

Sturges, P and Chimseu (1996) Information Repackaging in Malawi. *African Journal of Library, Archives and Information Science* 6 (2)1-91.

United Nations (1992) Regional Conflicts: Threats to World Peace and Progress; Final Report New York: United Nations, p.5.

United Nations (1998) The Causes of Conflict and The Promotion of Durable Peace and Sustainable Development in Africa. Report of the Secretary General to the UN Security Council. New York: United Nations, pp.7-15.

UN (2001) United Nations Charter. Article, 52(2). Http://Www UN. Org/About

UN (2002) The Role of the Economic Dimension in Conflict Prevention. New York: United Nations, pp.1-150.

United Nations (2003) United Nations Libraries and Information Society Exhibition At The UNGO Library November-31 December, p.39.

World Bank (2005) Reshaping The Future Education and Post Conflict Reconstruction. Washington D. C. World Bank, pp.5-23.

World Bank (2003) Breaking the Conflict Trap: Civil and Development Policy- Washington D.C: World Bank, pp.121-171.

Yaqub, N (2001) The Theoretical Frame Work for the Study of Conflict Indicators and Early Warning System. Paper Presented at International Seminar on Conflict held in Abuja from July 18th-19th, 2001. Unpublished.

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Book Reviews

Africa: A Guide to Reference Material. 2nd Revised and Expanded Edition by John McIlwaine. Lochcarron, Scotland: Hans Zell, 2007., 608p. ISBN 0-9541029-3-2 ISBN-13: 978-0-9541029-3-7.

This guide evaluates major reference sources on Africa South of the Sahara but excludes sources such as bibliographies, indexes, abstracts, and other sources.

The arrangement of the guide is straight forward, as it provides for a general section on Africa as a whole This is followed by the broad regions of North-East Africa, East Africa, Central Africa, West Africa and Southern Africa, and then by individual sub-regions and countries. There is a further breakdown according to countries of former colonial affiliation and European language. For example, West Africa is divided into sections: Anglophone, Francophone, Lusophone and former Spanish-speaking areas.

The entries/materials under each geographical unit are arranged according to eight broad categories of: *Handbooks, Yearbooks, Statistics, Directories of organisations, Biographical sources, Atlases and Gazetteers, Earth Sciences*, and finally *Biological Sciences.*

This 2nd edition of *Africa: A Guide to Reference Material* (AGRM2) lists 3600 entries with the start-off point being 1938 and the cut-off point being 2006. The 1st edition published in 1993 (AGRM1) lists 1,766 entries covering the past 100 years up to 1992. AGRM2 has been wholly revised, new categories of material included and older publications excluded.

Each title is described and analysed for content. The book has a new section on Earth and Biological Sciences, while the older pre-1938 imprints from AGRM1 are omitted. AGRM2 has reviews from over 80 journals with the entries arranged alphabetically by title or author rather than by date of publication as in AGRM1. Furthermore, the AGRM1 single index has been replaced by an author/title index and a separate expanded subject index to accommodate the increased subject range of this new edition. Index numbers refer to citation numbers and not to page numbers. AGRM2 lists a substantial number of electronic resources which are critically reviewed and evaluated.

More than 80% of the of the titles listed in the new edition were personally inspected by the author. These titles are located mainly in the libraries of the University of London's School of Oriental and African Studies (SOAS) and that of the Afrika Studiecentrum (ASC) in Leiden, the Netherlands. Other UK libraries and legal deposit libraries abroad in the USA, France, Portugal, and the Cape Town branch of the National library of South Africa were consulted. The inspection on the Internet of electronic library catalogues on the Internet such as the Library of Congress and Northwestern University provided the author with immense bibliographical resources.

The author has to be commended for putting together this useful reference source, which would be quite useful for librarians, researchers and students.

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Information Literacy for Tertiary Education Students in Africa by Ayoku A. Ojedokun. Third World Information Services Limited, Ibadan, Nigeria. 2007. 192p. ISBN: 978- 32836-3-4. Price: N2,000:00; £20

Powered by many years of study, research, teaching and practical expenses, this book promises to positively catapult librarians, researchers and students into a high level in information literacy. The author, Ayoku Ojedokun, wrote the book as a result of his vast experience in the practice of librarianship to provide the readers, especially students, with guides on searching and retrieving necessary information for their study and research. The preface provides an overview of the contents of the book, while the Foreword, written by Kay Raseroka, a librarian of international repute and former IFLA president, sets the pace of the book.

There are ten chapters in the book. In the first chapter, the author clarifies the concept of tertiary education, identifying the challenges of tertiary education in Africa, role of information and communication technology in tackling some of the problems identified, and the relationship between the learning process and information literacy. In Chapter Two, the concept of information, different formats of information sources, as well as the use and importance of information were identified. Chapter Three describes the concept information literacy, examples of information literacy curriculum and the practices involved, while Chapter Four highlights the various types of information sources that may be consulted by researchers, students and librarians for their research. The author went a step further to differentiate between these sources in terms of use and reliability.

The various formats of information and how they can be accessed are presented in Chapter Five. It provides examples of the four major access tools that could be used in retrieving information. Chapter Six highlights information search strategies. One of the major problems encountered by students, researchers and librarians is retrieving information from automated catalogues. The book provides a guide on how to use Boolean operators (AND, OR, NOT) in retrieving relevant information. Useful Internet links were also provided as a guide. Chapter Seven provides an overview of the Internet as

information provider. Topics such as Internet addresses, hyperlinks/hypertexts, search engines, library gateways were discussed and illustrated with pertinent examples. Chapter Eight highlights the criteria to use in the evaluation of information sources available on the Internet. Chapter Nine focuses on copyright issues and the concept of fair use. This topic will be of great importance to librarians and students alike. The author explains the idea of fair use as it relates to the Universal Copyright Convention. He also focused on issues like plagiarism and copyright infringement. The last chapter of the book focuses on citation and citation formats that could be adopted by researchers. There are ample illustrations. The author has touched on one of the major problems encountered by students, researchers and librarians when writing articles or research papers. In all the chapters, copious examples from Africa are provided.

A major quality of the book is the inclusion of review questions, references and bibliography in each chapter. This allows the reader to test his or her knowledge of the subject matter in each chapter. The references and bibliography give further credence to the quality and authenticity of the content of the book. An overview of answers to review questions at the end of the book provides the readers with an opportunity to determine whether he or she understood the questions and could answer them correctly. Also, the inclusion of a glossary of terms at the end of the book is commendable as it gives short explanations on technical terms used in the book.

The cover design, illustrations and the quality of print provide aesthetics to the book, as they add more colour to the text. Overall, the book is well produced. I strongly recommend the book to all tertiary institution students, researchers and library and information science professionals in Africa and other parts of the world.

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Aawambo Kingdoms, History and Cultural Chance – Perspectives from Northern Namibia, by Lovisa T. Nampala and Vilho Shigwedha. Basel: Schlettwein Publishing, 2006, 274 p.(Basel Namibia Studies Series). Price 48.00 CHF; £20

While there is an argument for a thematic coherence that makes this publication into a single book, the volume constitutes two books in one, both based on research among the Aawambo of Northern Namibia. The publication is not a book in the classical sense but a compilation of two masters' theses by the first two students to graduate in History from the University of Namibia, a very commendable effort given the dominance of Namibian history writing by Europeans and non-Namibians before the independence of the country in 1989. The introduction to the publication, which provides an interesting review of the publication, is written by Jeremy Sylvester, who supervised the two theses. The two studies demonstrate how oral traditions can be used together with some archival sources to reconstruct the past of a people.

The first study, titled *Christianisation and Cultural Change in Northern Namibia: A Comparative Study of the Impact of Christianity on Oukwanyama, Ondonga and Ombalantu, 1870 – 1971,* by Lovisa Nampala, is a study of traditional ceremonies and practices among three Aawambo kingdoms and how such ceremonies and practices faired under the double impact of...colonialism and Christianity. Nampala provides very detailed descriptions of marriage, naming of children, circumcision, rainmaking and death in the three kingdoms and how these were affected by colonialism and the introduction of Christianity (mainly Finnish, Catholic and Anglican missions) in Northern Namibia. She provides minute details of who performed these ceremonies, the cultural meaning of the ceremonies from kingdom to kingdom, what people wore at these ceremonies and what would happen to those who violated them. For instance, getting pregnant before marriage or before going through all the rituals of marriage could result in death. Boys could die during circumcision and no explanation would be provided to parents.

The study contends that the Aawambo had their own religion before the coming of the European missionaries and colonisers. They believed in the spirit of Kalunga, a god who was wiser and was the creator of the world. They honoured the ancestors because ancestors had easier access to Kalunga than the living.

Vilho Shigwedha's thesis: **The Pre-colonial Costumes of the Aawambo: Significant Changes under Colonialism and the Construction of Post – Colonial Identity** focuses broadly on Aawambo costumes and fashion, and how they changed as a result of missionary and colonial incursion and their meaning in the development or construction of a post-colonial identity in Northern Namibia. Like Nampala, he studies the Aawambo kingdoms and provides detailed descriptions of dress in pre-colonial times and its meaning in shaping the identity of the people. He argues that Aawambo costumes were largely from animal skins and were produced by local people with highly developed skills. He sees the costumes changing over times long before the missionaries and colonisers, as a result of long distance trade and therefore the importation of new materials such as beads used in hair styles.

Another interesting discussion in the thesis is the one on the Aawambo hair styles. As the author argues, these are a medium of non-verbal communication and represent a bodily vocabulary. The hairs could be short or long, going down to heals of women. These were decorated with seeds of local palm trees. What is interesting is that the hair styles represented different meanings and differed from one clan or kingdom to another. Generally, girls were not allowed to cut their hair until the age of 6 when they start plaiting. A hair style could be won to show that a young girl was not yet ready for marriage, or could demonstrate transition from girlhood to womanhood. Girls who became pregnant before marriage could have their heads shaved to shame them.

All the above were destroyed by the missionaries and colonisers as they were rejected as primitive and pagan practices. With the destruction of Aawambo traditional costumes, local fashion design skills also died though there were pockets of silent resistance across the region.

The study concludes with a discussion of fashion today, highlighting the confusion on what

really constitutes traditional costumes. The author brings out discussions of the destructive nature of fashion, whereby some people today even argue that the way one dresses may entice men to commit rape. This is a discussion not peculiar to Northern Namibia, but is heard in many other countries on the continent. There are concerns about what to conceal or to expose when one dresses up.

What pulls the two studies together is the single theme that the introduction of Christianity and colonialism negatively impacted on Aawambo traditional culture and therefore destroyed their version of life. In fact, this theme could have been used to merge the two studies into a single and coherent book. In this way the glaring overlap between the two studies would have been avoided. A single book would also have used a single style and avoided the obvious imbalance in the use of language that characterises the current publication. The first author used too many Aawambo words and expressions which could be discouraging to a non-Aawambo or non-specialist in Aawambo cultural history. Also, the book could have been edited more thoroughly to eliminate some of the grammatical and typographical errors.

Another shortcoming of the studies is the failure of the authors to read some of the key written languages in the literature, German and Finnish. The records of the Finnish Lutheran Church in Finland, Rhenish Mission in Wuppertal-Barman in Germany as well as the German colonial archives in Potsdam would certainly have enriched the theses.

Overall, these are very important contributions to the study of the cultural history of Northern Namibia, but their appeal is very limited. Theses are by nature very narrowly focussed and tend to have less appeal to non-specialists. The same is true here. The appeal beyond Aawamboland and Namibia is not there. Their importance however, lies in the fact that research that would ordinarily be available to specialist researchers only, is made available to the wider readership through this publication.

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New Publication

Information Literacy for Tertiary Education Students in Africa by Ayoku A. Ojedokun. Third World Information Services Limited, Ibadan, Nigeria. 2007. 192p. ISBN: 978- 32836-3-4. Price: N2, 000:00; £20

The book is one of the pioneering books on information literacy in Africa. The book is particularly useful at this stage of Africa's development when attention is being focussed on the need for graduates of African tertiary institutions to compete effectively in this era of globalisation, which requires lifelong learning.

Librarians and other information professionals along with tertiary education students themselves are expected to have a depth of understanding of the information literacy concept. This is to enable students to develop into lifelong learners. This book is written to address the issue of information literacy and lifelong education.

The book is divided into ten chapters:

Chapter 1: The Concept of Tertiary Education

Chapter 2: The Concept of Information

Chapter 3: Information Literacy.

Chapter 4: Information Sources

Chapter 5: Information Access Tools

Chapter 6: Information Search Strategies

Chapter 7: Internet as Information Provider

Chapter 8: Evaluation of Information Sources

Chapter 9: Copyright Issues

Chapter 10: Citation and Citation Formats

For further information, and order of the book contact:

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Professional News and Events

AJLAIS to be included in Web of Science

A landmark in LIS journal publishing in Africa was recently made when the authorities of Thomson ISI agreed to include *African Journal of Library, Archives and Information Science* (AJLAIS) in Web of Science (Social Science Citation Index) as from 2007. It will be the first African LIS journal to be in the Index. Since the inception of Web of Science (formerly ISI, now Thomson ISI) in 1963, only 32 journals published in Africa have been indexed - South Africa, 23; Kenya; 2 and one each, in Egypt, Ethiopia, Ivory Coast, Nigeria, Uganda, Zambia and Zimbabwe. AJLAIS will be the only journal published in Nigeria that will be included in Web of Science, after the defunct *Nsukka Studies in African Literature* edited by renowned Chinua Achebe. AJLAIS is currently indexed by *Library Literature and Information Science* (USA); and abstracted by *Library and Information Science Abstracts* (UK); *Library, Information Science and Technology Abstracts* (USA) and *African Studies Abstracts Online* (Netherlands).

IFLA Conference in Durban- A Huge Success

The IFLA Congress and Conference, recently concluded in Durban, South Africa from 19-23 August 2007, was a huge success. It attracted 3051 participants from 115 countries. More than a third of the participants came from Africa. There were precisely 1363 participants from Africa, of which 1116 came from South Africa. The conference was well organised. The organisation of the conference was comparable to other IFLA conferences, recently held in Europe and Asia. The papers presented at the conference are of high quality. There was a variety of activities including the opening ceremony, the cultural night and the beach party. The highlight of the conference was the beach party that was held in front of the Indian Ocean. It was fun galore. Many young professionals mingled excitedly with septuagenarians and octogenarians on the beach sands. IFLA Durban is one IFLA conference many will never forget in a hurry. Members of the National Organising Committee, the Library and Information Association of South Africa (LIASA) and the beautiful people of South Africa, deserve big congratulations for a job well done. Meanwhile, Brisbane has been announced as the host city for the 2010 conference. The 2008 conference will be held in Quebec, Canada, and the 2009 conference, in Milan, Italy.

New Changes in IFLA Africa Section

The IFLA Regional Office in Dakar has been moved to the University of South Africa in Pretoria. The Dakar office served IFLA Africa for 20 years. Meanwhile, a new set of officers to run IFLA Africa has been elected. The new Chairperson of IFLA Africa Section is Ms. Buhle Mbambo-Thata of South Africa, while the Secretary, is Mr. James Daniel of Nigeria. Ms. Helena Asamoah of Ghana was elected to the IFLA Board to represent Africa. Mrs. Kay Raseroka, Director University of Botswana Library Services was honoured at the 2007 IFLA Conference in Durban, South Africa, for her meritorious service to the association. It will be recalled that Mrs Raseroka was the first African to serve as IFLA President. Also honoured, was Mr. Henri Sene who served as IFLA Africa Regional Manager for twenty years.

AJLAIS Editorial Member becomes Dean of Education

Professor (Mrs.) Morayo Atinmo, Professor of Library and Information Studies at the University of Ibadan, Nigeria, and currently an editorial board member of AJLAIS, was recently elected the Dean of the Faculty of Education, University of Ibadan, Nigeria. Professor Atinmo is a graduate of the University of Ibadan, Nigeria and Syracuse University, USA. She holds BA, MLIS and PhD. Prof Atinmo is the third librarian to be elected the Dean of Education, in a row, at the University of Ibadan, Nigeria.

New Editor-in-Chief Takes Over

Dr. M. A. Tiamiyu, an Associate Professor (Reader) in Information Science, and currently, Associate Editor- in -Chief of AJLAIS, takes on the mantle of editor-in-chief of African Journal of Library, Archives and Information Science (AJLAIS), with effect from January 1, 2008. The new Editor-in-Chief attended the University of Ibadan, Nigeria and the University of Western Ontario, Canada. He holds B.Sc. and M.Sc. in Economics, MLIS and PhD in Information Science.

Forthcoming Conferences

International Association of Agricultural Information Specialists (IAALD) 12ᵗʰ World Congress, 24-28 August, 2008, Tokyo, Japan. The conference will be held in conjunction with the Asian Information Technology in Agriculture (AFITA) and the World Congress on Computers in Agriculture and Natural Resources (WCCA). The theme is "The Agricultural Information Community of the Future: Progress, Development, Partnerships." For further information, contact Takashi Nagatsuka at nagatsuka-ttsurumi-uac.jp, or visit the IAALD website at: http://iaald-afita-wcca2008.org.

74th IFLA World Library and Information Congress and General Conference, 10-15 August 2008, Québec, Canada. The theme is "Libraries without borders: Navigating towards global understanding." For further information, contact lcabral@asted.org, or visit the IFLA website at: http://www.ifla.org

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AIMS AND SCOPE

African Journal of Library, Archives and Information Science is established mainly to provide a forum for librarians, archivists, documentalists, information scientists and other information related professionals in Africa to report their research findings but with emphasis on African setting. The Journal is refereed by distinguished scholars. Emphasis is on empirical research; however, manuscripts of high quality on theoretical aspects of the three information related disciplines will be considered for publication.

MISSION

To provide on a regular and sustainable basis an excellent scholarly journal for reporting empirical research findings in the information profession in Africa

VISION

To be the main resource base for library, archives and information science research in Africa

NOTES TO CONTRIBUTORS

Contributors are to submit the manuscript by e-mail file attachment using MS word and a hard copy, typed double space on A4 paper. Ample margins should be provided. The title, author's name, position and place of work should appear on the first page. Subsequent pages, not more than 15, should include an informative abstract of not more than 100 words. A manuscript will be considered only if it has not been published elsewhere.

References and notes should be indicated in the text by names of authors and date of publication in brackets. The list of references should be listed in an alphabetical order at the end of the text.

References to journal articles should be in the following order: Author(s), date, title, journal's name, volume number, issue number and pagination, inclusive e.g.:

Mazikana, P.C. (1987) Archives and Oral History: Overwhelming Lack of Resources. *Information Development*, 3 (1) 13-10.

References to books should be in the following order: Author(s), date, title, place of publication, publisher, pagination, e. g.

Aboyade, B.O. (1989) T*he Provision of Information for Rural Development.* Ibadan: Fountain Publications, 104 p.

References to contributors in collected works should be in the following order; authors(s), date, title of contribution, name of the editor, title of the collected works, place of publication, publisher and pagination, inclusive e.g.:

Neill, J.R. and Kotei, S.I.A. (1981) Towards a National Information System for Botswana. In: Inganji, Francis (ed.) *Use of information and Documentation for Planning and Decision Making.* Gaborone: NIR, pp. 36 – 53.

No charge is made for publication. Fifteen copies of reprints of each major article will be supplied to the principal author.

Manuscripts and other editorial materials should be directed to the Editor in Chief, Professor L.O. Aina, Department of Library and Information Studies, University of Botswana (e-mail:ainalo@mopipi.ub.bw) or any member of the editorial board nearest to you