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Editorial Feature

Information Access/Accessibility in a Digital Environment

Stephen M. Mutula
University of KwaZulu Natal
Private Bag X01
Scottsville, 3209, South Africa
Mutulas@ukzn.ac.za

The subject matter of this editorial is *information access* and *accessibility.* The choice of this subject is informed by the themes covered in the articles published in this issue of AJLAIS. Collectively, the articles focus on *research publications output; iinformation behavior*; *human capacity building in libraries*; *accreditation and university library services*; *use of electronic databases and electronic information sources* from country and organisational contexts**.** Besides, research on information access/ accessibility in the information science literature seems relegated to the periphery despite their centrality as tenets of the evolving information society. The concepts of access and accessibility are often and inappropriately used interchangeably in the literature. However, access in this context refers to the users finding the information they require and successfully retrieving it. In contrast, aaccessibility (sometimes referred to as *universal access*) refers to a trajectory of equal opportunities by all in the society to access and use information services irrespective of their location and physical abilities.

Access/accessibility is inextricably linked with the subjects of informetrics and bibliometrics, information behaviour, human resource development, and electronic resources use. Oltmann (n.d) observes that information access is implicated in multiple research areas in library and information science (LIS), yet it has received little explicit attention from researchers. The importance of information access is also implicit across several studies within the information sciences and beyond. For example, bibliometric and informetric studies affect the information flow and utilisation patterns within, between and outside institutions and countries. Bibliometric and informetric studies within the library and information science (LIS) field solve problems related to collection development, information retrieval, systems design, user studies, and knowledge organisation, to name a few (Ocholla & Ocholla, 2007). Similarly, information access is embedded in Wilson's (1981) model of information behaviour covering concepts of information need, information seeking, information exchange, and information use. Jaeger (2007:843) is succinct that without access to information, there can be no exchange, use, collection, or management of information. The concept of information behaviour has steadily evolved from information seeking and now focuses on how people interact with information, how and when they seek information, and what uses they make of it (Bates, 2010).

Users often encounter many problems in the process of searching and seeking information, whether in paper form or online. For this reason, they need skills to succeed in the specific acts associated with seeking and locating information. The subject of capacity building in libraries should therefore be seen as closely intertwined with information behavior and any efforts directed at satisfying users information needs. Bates (2010) in his extensive seminal papers in information searching tactics and search techniques noted that greater attention should be paid to the complexities of identifying sources and working one's way through resources to locate the desired information.

The internet has played a catalytic role in the emergence of knowledge and web-based information management. It has helped in the integration of knowledge resources, sharing of information, customisation of knowledge and information to suit individual needs, enhancement of knowledge organisations, and the creation and distribution of knowledge. With the continued growth of internet-based applications, digital literacy has become increasingly recognised as critical for access and use of e-information sources such as databases that were previously accessible only through intermediaries. Moreover, effective use of various digital resources to locate information, including the internet and online databases, requires skills, competencies and familiarity with natural inquiry, Boolean search strategies, and information organisation and retrieval systems (Mutula, 2007).

While the Internet provides opportunities for one to find publications, locate specialist publications and grey literature that can be difficult to find elsewhere, it poses difficulties to both novice and expert users in locating the relevant information for decision making. Existing search tools such as search engines frequently produce extensive lists of search results, requiring users to spend inordinate amount of time examining a great number of irrelevant and often incomprehensible citations in order to find a ew pertinent hits. The need to organise Internet resources to enhance access and use is crucial. When properly organised, materials on the Internet should, in the same way as a catalogue, provide a bibliographic description of library record; enable the user to know what the library has on a given subject and author; and also enable access to external resources.

Information generators and providers must therefore be prepared to offer the users an enabling environment that is conducive and friendly for seeking and using information. The SADC E-Readiness Task Force (2002) provides a framework that is illuminating on how information providers can create an enabling environment to assist the user in their information seeking tasks. The framework provides variables of readiness in digital environments that include, among others, human factors to enable technology to be used, such as education and training, ICT skills and application of different technologies. Similarly, e-Europe Action Plan (2004) emphasises digital literacy; ICT skills development, and lifelong learning to enable the users to cope with the vast amount of information being generated. The World Bank (2002) also adds its voice in recommending human resource skills development.

The WSIS declaration of principles makes it explicit that in the information society certain actions are needed to facilitate access and accessibility. Such actions include capacitating all people to enable them to access information using ICT; developing human capacity to exploit the benefits of ICT; building public awareness of ICT capabilities; putting in place education and training programmes in ICT; and eliminating illiteracy and enhancing ICT literacy (WSIS, 2003). Digital literacy is increasingly being recognised worldwide as a panacea for functioning. Lor and Britz (2008) note that development of human intellectual capability is one of the most important factors that facilitate further development and sound economic growth in the era of globalisation. They argue that, if developing countries do not invest more in education they will be excluded from the global knowledge pool. Citing Norris (2000:59), the duo point out that it is of little use to have access to relevant information but not the educational infrastructural support, including R&D facilities, to enable people to create new knowledge.

Efforts to enhance access should be cognisant of common misgivings about the quality of information found on the Internet as well. While one of the articles in this current issue of AJLAIS focuses on the impact of accreditation on libraries in terms meeting national education standards, work on quality assurance should extend to cover the qualitative aspects of information infostructure.

Information security is another factor that has important ramifications for access/accessibility. Information security as used in this article refers to the security of information transmitted between the information provider and the user (Guenther, 2003). Information security also refers to the protection of data from accidental or malicious modification, destruction or disclosure. An information secure environment inspires in the user confidence in information access, sharing and use. It also contributes to the accuracy, reliability, relevance, adequacy and timeliness of information.

Lor and Britz (2007) examine the role of physical infrastructure in promoting access to information. They assert that a prerequisite for successful participation in the Knowledge Society is a well-developed, well-maintained and affordable information and communication infrastructure. A well-developed and well-maintained information infrastructure is not sufficient unless it can provide access to relevant information needed.

Al Sayed (2008) notes that People with disabilities (PWD) face lots of geographical and social barriers. He avers that there is need to find alternative solutions, which can use the ICT (Information & Telecommunications Technology) to meet the access and service needs for PWDs. To promote such access, he recommends accessible design (or design for all) by using technical standards, adaptive hardware and software, and multi-modality architecture. Furthermore, access/accessibility to PWD can be accomplished by using appropriate educational and administrative infrastructure, encouraging the design of ICT equipment production, promoting the development of technologies, encouraging the research on the information society including innovative forms of networking, and by adapting ICT infrastructure, tools, and applications.

Access to information is one of the key pillars of WSIS Action Line 10 on ethical dimension of the information society. In this regard. Britz (2008), points out that increased censorship in many parts of the world, especially in China, together with high levels of illiteracy, high cost of specifically scholarly publications, and limited access to the Internet in most developing countries, has severely limited the creation of equal opportunities for participation in the global information society, especially by the poor. He points out that having to rely on the knowledge of other people creates asymmetric power relationships and puts them at risk of exploitation or exclusion.

Finally, in an information society where it is presumed that every individual should have access/accessibility to information without distinction, efforts should be made at policy and practical level to facilitate information service providers through the following interventions:

- Getting right the information needs of users
- Capacity building, especially with respect with digital literacy and techniques of searching information
- Building robust ICT infrastructure
- Ensuring quality information (accurate, relevant, reliable, adequate, useful, etc.)
- Upholding rights of users (freedom of expression, security of information and that of users)
- Ensuring accessibility by people with disabilities.

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Stephen Mutula is Professor in the information studies programme and also the academic leader for Development Cluster at the University of KwaZulu Natal. He holds a PhD (University of Johannesburg), B. Ed & PGD. Comp Sci (University of Nairobi) and Masters in librarianship (University of Wales UK). He researches and publishes in the areas of e-government, ICT4D, information poverty, information ethics, information society and knowledge management among others. He is a rated scholar by National Research Foundation of South Africa.

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Reading Interest and Alternative Format Utilisation by Persons with Visual Impairment in Nigeria

'Niran Adetoro
Department of Library and Information Science,
Tai Solarin University of Education,
Ijebu-Ode, Nigeria
niranadetoro@yahoo.com

and

Morayo I. Atinmo
Department of Library, Archival and Information Studies,
University of Ibadan,
Ibadan Nigeria
morayoatinmo2004@yahoo.com

Abstract

The transcription of information in conventional materials into alternative formats for the use of persons with visual impairment (PVI) in Nigerian libraries is often premised upon the belief that the reading interests of such persons are as varied as or similar to those of sighted persons. Such belief might be in error, thereby unwittingly forcing such persons to read whatever materials had been transcribed and provided for reading by the libraries instead of what they really want. This study was undertaken to obtain evidence to confirm or debunk the belief. Fourteen libraries, including public libraries and those serving users in non-governmental organisations, tertiary institutions and secondary schools, were purposively selected based on the population of their visually impaired users who used the alternative format materials. The sample of users was selected proportionately to population of PVI in the libraries, and data from 71.3% of the 563 administered copies of a questionnaire that were retrieved were analysed. The results show that adult PVI had high reading interests in religious, business/enterprise and entertainment materials, and in manuals and reference materials, while secondary school respondents were interested in arts related subjects, reference materials, manuals, and animal stories. Braille is the most frequently utilised format (79.8%), although it was preferred by a lower percentage of the users (58.3%). The study recommends that the reading interests and format preferences of PVI, as had been found out in this and other studies, should be carefully considered when libraries are considering the nature of alternative format materials that should be provided for such users.

Keywords

Reading interest, Alternative Formats, Utilisation, Persons with Visual Impairment, Libraries, Nigeria

Introduction

Sighted persons can naturally read and communicate using conventional information materials such as print books, reference sources, serials, databases, etc. But for persons with visual impairment (PVI), reading and communication usually must be in alternative formats such as Braille, talking books and large prints because of their visual impairment. According to Royal National Institute for the Blind (RNIB) (2006), PVI refers to people with irretrievable sight loss, and this simple definition covers a wide spectrum of different impairments. Abosi and Ozoji (1985) clarifies that the visually impaired includes those who are totally blind, low visioned, partially sighted and those who have short sight, long sight or astigmatism. The visually impaired does not include those whose sight problems can be corrected by spectacles or contact lenses, or those whose sight might be improved by medical intervention (RNIB, 2006).

Persons with visual impairment, like their fully sighted counterparts, are expected to show interests in gaining information from various disciplines and topics for academic and leisure purposes. The reading for information and knowledge interests of PVI may be as varied as those of sighted persons. This was confirmed by the studies of Horten and Horten (1995) and of Byrne, Cylke, Hagle, Herdon and Perry (1990). These authors also posit that the reading interest and the information materials required by PVI vary as do the users themselves, in terms of background and specific needs. They contend that the reading interest of PVI just like the sighted ranges from adventure to history, mystery, politics, biography, natural science, humour, romance, sports, religion, etc. In addition, people with visual impairment may also need information connected with their disability that sighted people would not bother about. So it becomes essential for libraries and other providers of information materials in alternative format for PVI to investigate periodically the reading interest needs and preferences in the rapidly changing information environments of digital societies.

Reading will be more rewarding to PVI if information materials are provided in their areas of need and interests and also in the appropriate format of readability. Knowledge of the reading interest of PVI will be useful for the planning of adequate library and information services in terms of types of information needed or desired, and the types of materials that should be acquired and made available in different formats. This will also help in the selection of the materials to be converted to alternative format.

In many countries, the demand for alternative format utilisation by PVI appears to be high, but the extent of utilisation of materials is limited by lack of inadequate availability of such materials. PVI in many parts of the world have been exposed to alternative formats use through the efforts of specialised libraries, non-governmental organisations (NGOs) and other affiliated institutions through constant production and distribution of reading materials in alternative formats. Some of these institutions sell materials, while many lend them to their visually impaired users (American Council for the Blind, 2005).

The demand for the utilisation of audio recordings appears to be higher than other formats among PVI in many developed countries (Anne, 2000; Davis, Wisdom and Greaser, 2001). Audio recordings are popular among children and adults, even though there has always been a small but important demand for Braille by borrowers or buyers (National Library of Canada, 1996). In Nigeria, Basharu (2000) and Atinmo (2002) have highlighted the fact that PVI have visited libraries asking for materials in alternative formats to borrow to read or listen to. They also sometimes bring printed matter to libraries to be transcribed to Braille.

This is part of a larger study entitled "Relationship among Reading Interests, Information Materials Availability and Alternative Format Utilization by Persons with Visual Impairment in selected Libraries in South western Nigeria" earlier submitted for doctoral thesis at the University of Ibadan, Nigeria.

Statement of the Problem

Most libraries providing information services to the public and various groups in Nigeria have not been providing materials geared towards meeting the potential or latent needs of PVI for materials in alternative formats. The focus of government, libraries and institutions offering information services have not adequately recognised the reading interests of PVI in Nigeria, possibly because they are not aware of the population of PVI and their needs, or the need for special programmes for minority and disadvantaged groups such as PVI. Invariably, libraries providing information services to PVI have not met the reading interest of their visually impaired users. In many of the libraries providing information services to PVI, information materials in terms of Braille, talking books and large prints are generally inadequate. Utilisation of alternative format in libraries is low even though PVI have always demanded for increased use of alternative format in Braille, large prints and recorded tapes. There is constant need for research evidence to be updated and provided to policy makers in government and libraries on the conditions and needs of such special and disadvantaged groups in Nigeria that they are expected to serve. As emphasised by the Chartered Institute of Library and Information Professionals (CILIP) (2005), those developing services for PVI in libraries should ensure that visually impaired users are asked questions about their reading interests and information needs at least every two years, in order to ensure that the services and facilities remain adequate and appropriate.

This study therefore investigated the nature and relationship between reading interests and use of alternative formats by PVI in selected libraries in Nigeria. The study focused on visually impaired students in secondary schools, adult persons with visual impairment in tertiary institutions of learning, and others who are gainfully employed in society who patronise the services provided by public libraries and the libraries of non-governmental organisations.

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Literature Review

Reading interest is an important variable to investigate because high interest materials are more easily comprehended than low interest materials (Disibio and Savitz, 1992). Also, increased comprehension could lead to increased knowledge. It is generally acknowledged that because PVI have the same human composition as sighted people (aside from being visually impaired), their reading interests and information needs may be similar. A study of the homebound elderly with visual disabilities in Denmark (Nielson, 2005) found that the range of reading interest of the elderly visually impaired is as broad as those visiting the library in person. He reported that many of them have a high concentration on reading and their reading interest centres on natural science, and ancient history, and that many of the titles are required in foreign languages from special libraries. Atinmo (1999) also found that the reading interests of persons with visual disabilities in Nigeria are as varied as those of sighted individuals.

Byrne, Cylke, Hagle, Herdon and Perry (1990) however declared that the reading materials required by PVI vary in line with their backgrounds and specific needs. PVI need factual and recreational reading, educational materials, encyclopaedias, directories and all other kinds of publications, which are used by sighted people. Unlike sighted people however, they also need appropriate formats or auxiliary aids to help them access their required interests (Chartered Institute of Library and Information Professionals (CILIP), 2005). The Canadian National Institute for the Blind (CNIB 2005) reported that blind and visually impaired children often choose to read, if they are provided with books that are at an appropriate reading level and are about their personal areas of interests. The study further identified poems and short stories as the most preferred areas of interest to the children.

In a survey of visually impaired children, Thomason (1993) found that visually impaired students in high schools generally show slightly more interest in reading as a hobby, and that they read for pleasure but find active pastimes more enjoyable. It was also discovered that students find reading more appealing if they can choose their own materials themselves. The study also found that boys like to read science fiction, adventure, mystery, sports and short stories while girls were interested in adventure, mystery and romance. A similar survey (Kimmins, 1996) submitted that the reading interests of visually impaired boys are not the same with sighted boys, but that some similarities do exist. Sports materials which was highly rated by all, was the number one interest of visually impaired boys. Science materials were also popular amongst all boys, while poetry was rated as being of low interest for visually impaired boys. Reading will be more appealing to visually impaired students if they are offered reading materials in subjects that excite interest and attract them.

Bruce, Mckennell and Walker (1991) reported that 48% of blind and partially sighted adults in the United Kingdom (UK) read or used ordinary print materials (with aid though), 24% used large prints, 1% used personal reader, 13% used tape recording ,and 1% used Braille, but that the actual use of alternative format was likely to be limited by availability. Another UK survey (Davis, Wisdom and Greaser, 2001) found that 83% of adults who are blind and partially sighted use tape recordings. The Royal National Institute for the Blind also reported that 25% of blind and 4% of partially sighted people have its talking book player, although awareness of the service is fairly low; that 47% of blind and 51% of partially sighted people are not aware of talking book service; and that only 13% are aware that libraries can inform them about talking books (RNIB, 1997).

Ogba (2000) reported that visually impaired users of the Imo State library board visit the library section for the visually handicapped to use and borrow Braille books, moon type, talking books on cassette, large prints books and periodicals. Ogba

(2000) further clarified that apart from the moon type with few volumes existing in the library, there are numerous volumes of Braille and periodicals on various subjects which provide satisfaction for the visually impaired users. Large print books are in fewer subject areas while there are many recorded cassettes. Aldrich and Parkin (1994), in a survey of producers and users of tape recorded textbooks for the blind, reported that tape has one major disadvantage when compared with Braille and large prints because it does not allow, beyond serial presentation, the direct, random or parallel access to information. Half of the students surveyed read large prints; nearly all others used Braille. The users showed remarkable resolve and flexibility, and were enthusiastic about the possibility of Braille and large print supplements to taped books.

In another study, Aldrich and Parkin (1987), the users of tape recorded books complained of the time it takes for a book to be recorded; they felt that every opportunity should be taken to record only the relevant parts of the required books. The study suggested that providers should explore the possibility of dividing a book between several readers or volunteer recorders. Majority of users of talking books, according to Getz (2003), are visually impaired people who generally have no other way to read unless they read Braille; even though not many people do read Braille. For instance, in the UK, just 3% of the RNIB users read Braille, while in the USA, only 4% of the National Library for the Blind (NLB) users read Braille (NLB, 2002). In Israel, 3.9% read Braille, according to a study at the Central Library for the Blind (Getz, 2003).

Other researches confirm that tape is now a popular reading format (Crofts, Cleary, Keil, Franklin and Cole-Hamilton, 2001; Grundy, Alburg, Ali, Breeze and Sloggett, 1999; and Kennell, Yu and Greaser, 2000). The use of recorded materials on tape by PVI is widespread. This, Hatlen (1996) reasoned, is because individuals who lost their vision through the ageing process may never master Braille and they will, in all probability, enjoy their remaining years listening to talking books. Children with complex disability are confined to learning by listening. Their physical disabilities may also preclude their ability to write.

In an assessment of the use of large prints in the Netherlands, Schols (1995) viewed that the partially sighted people who prefer reading their information in large prints are considerable in number. He argued that this can be attributed to the ageing population which has resulted in a rise in the number of elderly people and, concomitantly, in the frailties associated with old age, such as poor vision. A study (Porter, 1997) declared that 75% of people with partial sight are able to read clear, large print materials effectively.

In summary, according to Tuttle (1996), it is important to be flexible and not take rigid stand in arriving at the best format for different categories of the blind and visually impaired. Tuttle submits that many persons, who learned Braille as adults, use audio formats for some reading tasks, and Braille for others. Moreover, no one library can hope to meet all the needs of such varied interests and formal preferences at different levels. Thus, Byrne et al (1990) suggested a national and international resource sharing initiative if the reading interests and information needs of all readers are to be met.

Theoretical Framework

Emery (1992) explained that users of a library have behavioural characteristics that are similar to those of consumers of material goods. As this study was concerned with reading interest and other factors that are associated with the extent of utilisation of information materials in alternative formats, the information utility theory (Jhingan, 1997; Schiller, 2000) was adopted to guide the study. The theory relates information utilisation with value of use and user satisfaction concepts, including the marginal utility of information. The application of information utility theory to explain user studies in library and information science stresses the dynamics of information consumer behaviour in the use of library and information systems. These theories have their roots in microeconomics.

Information utility theory assumes that users of information goods and services are rational beings. Each user assumes that the value of expected or anticipated information is always non-negative, though the value or utility of imperfect information may be negative. The user has full knowledge of the availability and the range of information products and services, as well as the choices open to him. He is also able to compare the satisfaction or utility he derives from information materials in terms of maximising his or her needs. He is able to choose rationally based on utility considerations, and that his choices are expected to be certain and positive.

In the context of this study and the information utility theory, PVI users of libraries are assumed to be rational beings. They know that the value of information they need should be non-negative and they are able to compare the satisfaction or utility derived from using the alternative formats materials available in the libraries, all in the quest to meet their reading interests and information needs. PVI also have full or at least adequate knowledge of information materials in alternative formats which they want to read and the choices available to them. The marginal utility of information theory is significant in this context because it argues that services or products (alternative formats) that bring about higher marginal utility (additional satisfaction) than is possible from other services or products will be demanded and used in greater quantity. In other words, PVI who are aware of and use alternative formats in libraries will, at any point in their use of the alternative formats, expend more efforts and other resources on the additional (marginal) use of those formats that give them additional greater satisfaction or utility than they would on other available formats. But before a PVI chooses to use or not use any alternative format, he is expected to have full or adequate knowledge of the nature and potential utility value of each of the available formats. The assumption of full or adequate knowledge by PVI is the only one that is often difficult to meet, although such level of knowledge can be promoted through adequate information dissemination on and trial provision of various alternative formats by libraries to PVI in their communities.

Research Questions and Hypotheses

The following research questions were investigated in the study:

(i) What are the reading interests of PVI in the selected libraries?

(ii) What is the frequency of use of alternative formats by PVI in the selected libraries?

The following research hypotheses were validated at the 0.05 level of significance:

1. $Ho_{1:}$ Reading interest of adult PVI will not have significant relationship with their utilisation of alternative formats materials in the selected libraries.

2. $Ho_{2:}$ Reading interest of secondary school PVI will not have significant relationship with their utilizsation of alternative formats materials in the selected libraries.

Methodology

The descriptive survey research design was used in the study. Fourteen libraries were purposively selected based on the population of PVI to which they were providing information materials in alternative formats. The South-West geo-political zone of Nigeria was purposively chosen for the study. This is because it is the only zone that has those libraries that have PVI users and materials in numbers useful for the study (Atinmo, 2002). The total population of PVI using the alternative formats in the selected libraries was 563, and a complete enumeration approach was used to collect data because of the small size of the total population.

Using the proportionate random sampling technique, the 14 libraries were stratified into two NGO libraries, four public libraries, two tertiary institution libraries and six secondary school libraries. A questionnaire, named the “Visually Impaired Adult Questionnaire (VIAQ)” (á = 0.73), was administered on the adult PVI in the first three categories of libraries. A second questionnaire, named “Visually Impaired Students Questionnaire (VISQ)” (á = 0.78), was administered on the student PVI of the secondary school libraries. The librarians in charge of the libraries assisted in the administration of the questionnaires by the researchers and their assistants who read out the questions to the respondents and recorded their responses on the questionnaires. A total of 410 out the 563 administered copies of the questionnaires (71.3%) were successfully completed and used for the study.

Results

Respondents' Characteristics

The collected sample data showed that male respondents were 256 (67.1%) while the female respondents were 136 (32.9%). There were 104 (26%) student PVI while 297 (74%) were adult PVI. Most of the respondents were single 303 (75.5%) while 98 (24.4%) were married. The data also showed that 224 (54.3%) of the respondents were totally blind while 177 (45.7%) were partially sighted.

Reading Interests of PVI

The respondents were asked to indicate their interests for reading for leisure and academic purposes. The reading interests of the respondents were analysed separately for the adults and the students.

Table 1: Reading Interest of Adult PVI (N = 297)

	Reading Interest	*Mean*	*Standard Deviation*
1	Religious materials on general and specific aspect of faith	3.62	0.72
2	Stories or text books about business and how to succeed in business	3.40	0.89
3	General entertainment materials such as magazines and periodicals	3.40	0.84
4	Manuals that teach how to do things	3.39	0.86
5	General and specific reference materials	3.30	0.94
6	Biographical accounts of individuals of achievements	3.23	1.02
7	Works of poetry that stimulate reasoning.	3.05	0.90
8	Drama books/plays with good plot	2.98	0.91
9	Works on security and safety and about security of lives and property	2.95	0.74
10	Works that stimulate entertainment and amusement /humour stories	2.88	1.06
11	Works/ text books related to the arts such history, literary studies and languages	2.86	0.92
12	Books/stories about romance and love life of people	2.82	1.10
13	Tales/stories describing how to get to places, how to make journeys to important places of interest	2.78	1.07
14	Accounts of events, things and happenings which have no cause or origin, works of mystery which cannot be explained	2.77	1.01
15	History text for leisure and academic purposes	2.71	1.19
16	Unusual and exciting tales of dangerous experiences, events or occurrence/adventure stories	2.65	0.97
17	Works or textbook on social sciences such as sociology, economics, political science etc.	2.54	0.87
18	General sporting events and sports personalities or a particular sports report	2.54	1.06
19	Detective stories that help unravel difficult crime	2.52	1.02
20	Works/textbook on technology, technological feats and happenings	2.51	1.10
21	News or stories about your local or immediate community events/happenings	2.49	1.15
22	Political stories, political events and writings about politics locally or globally	2.18	1.22
23	Natural science works or textbooks such as physics, chemistry and biology, scientific happenings and discoveries	1.86	1.00

Top on the reading interests of the adult respondents (Table 1) were religious books and materials on general and specific aspects of faith (Mean = 3.62; S.D. = 0.82), business and entrepreneurial books and materials on how to succeed in business (Mean = 3.40; S.D. = 0.89), entertainment materials such as magazines and periodicals (Mean = 3.40; S.D. = 0.84), manuals that teach how to do things (Mean = 3.39; S.D. = 0.86), general and specific reference sources (Mean = 3.30; S.D. = 0.94), biographical events or individuals (Mean = 3.23; S.D. = 1.02), and stimulating works of poetry (Mean = 3.05; S.D. = 0.90). At the bottom of the reading interest were books on natural science related subjects such as physics, chemistry and biology (Mean = 1.86; S.D. = 1.00), followed by political stories, political events and political related writings (Mean = 2.18; S.D. = 1.22), local community events or stories (Mean = 2.49; S.D. = 1.15), technology related subject areas, feats and happenings (Mean = 2. 51; S.D. = 1.10), detective stories (Mean = 2.52; S.D. = 1.02), general sporting events, sports personalities and sports reports (Mean = 2.54; S.D. = 1.06), and social science related books and materials (Mean = 2.54; S.D. = 0.87).

For the secondary school respondents, their reading interests were strong in arts related subjects such as history, literature, languages, etc (Mean = 3.27; Standard Deviation (S.D.) = 0.84); reference sources (Mean = 3.04; S.D. = 1.06); manuals that described how to do things (Mean = 3.04; S.D. = 0.95); followed by animal stories or stories on specific kinds of animals; stories about family life and about families and school related challenges with the following mean and standard deviation scores, respectively. The areas of least interest to the students included books on natural science subjects such as physics, chemistry and biology (Mean = 1.52; S.D. = 0.91); stories about unreal scientific events/ science fiction (Mean = 1.80; S.D. = 0.98); and tales of a war or about wars (Mean = 2.10; S.D. = 1.04). The other areas are historical fiction describing unreal events, mysterious stories with no cause or origin and poems for leisure and class work.

The results showed that the respondents in this study are generally not interested in reading science related books and materials, as well as science fiction materials. This may be explained by the fact that information bearing materials for visually impaired persons are very weak in capturing details in these areas. The finding that student PVI least liked such materials, just as the adult PVI, should be of concern to educationists, for which a solution should be sought, possibly by investing in the acquisition or production of materials in alternative formats that provide lively and interesting details for student PVI learners.

Use of Alternative Formats Materials

The data showed that Braille materials recorded high frequency of use among the respondents. Three hundred and twenty PVI (79.8%) used Braille materials daily while 44 respondents (10.9%) used Braille two or three days in a week. The survey revealed that the frequency of utilisation of talking books or recorded materials among PVI in the libraries was less, compared to Braille materials. Ninety-five respondents (23.6%) used talking books daily, while 142 (35.4%) used talking books two or three days in a week. However, as many as 105 respondents (26.1%) used talking books only once in a month. Large prints were used daily by only 19 PVI (4.7%), and two or three days per week by 9 (2.2%). As many as 125 (31.1%) of the respondents used large prints on monthly basis, while 220 (54.8%) had never used large prints. This low level of utilisation for large prints could be attributed to the fact that large print publication and availability is very low in Nigeria, and also that majority of the respondents are totally blind and cannot use even large prints. By contrast, Braille is the most utilised format because it is the most available in all the libraries.

Table 2: Reading Interest of Secondary School Adult PVI (N = 104)

	Reading Interest	*Mean*	*Standard Deviation*
1	Materials or textbooks on Arts subjects such as History, Government and Literature	3.27	0.84
2	Reference materials such as dictionaries, encyclopaedia, directories, etc	3.04	1.06
3	Manuals/stories that describe how to do things	3.04	0.95
4	Stories about animals or specific kinds of animals	2.91	1.06
5	Stories on family life and about families	2.91	1.01
6	Stories on school activities and about the challenges students face at school.	2.86	1.00
7	Funny or amusing and entertaining stories/humour stories	2.82	0.99
8	General or specific sporting events, achievement or stories	2.77	1.29
9	Stories about the life of people who have achieved/biographies	2.70	1.02
10	General unreal stories and fantasies	2.67	1.13
11	Books/textbooks on subjects such Economics, Commerce and Business Management	2.65	1.10
12	An account of usual and exciting or dangerous experience or events, feat or occurrence/adventures stories	2.56	1.12
13	Poems for relaxation and for classroom work	2.51	1.16
14	Tales of events, things or happiness which have no cause or origin, mystery stories	2.47	1.01
15	Historical literature or stories describing unreal or imaginary events or people/ historical fiction	2.33	1.10
16	Tales on a particular war or about wars/war stories	2.10	1.04
17	Stories describing unreal scientific event(s) or people / science fiction	1.80	0.98
18	Books or textbooks on natural science subject such Physics, Chemistry and Biology	1.52	0.91

According to direct observations made in the libraries, the frequency of utilisation of Braille materials in the secondary schools and NGO libraries was encouraging. But the same cannot be said of the public libraries and the tertiary institutions. The public, school and tertiary institution libraries had little to show in terms of talking books, hence utilisation was rather low. Utilisation of talking books in the NGO libraries was noteworthy, but large prints were rarely used in all the libraries.

Table 3: Frequency of Utilisation of Alternative Format Materials

Period of utilization	*Braille*		*Talking Books*		*Large Prints*	
	Frequency	*%*	*Frequency*	*%*	*Frequency*	*%*
Daily	320	79.8	95	23.6	19	4.7
Two/three days weekly	44	10.9	142	35.4	9	2.2
Weekly	17	4.2	28	6.9	11	2.7
Fortnightly	4	0.9	31	7.7	17	4.2
Monthly	16	3.9	105	26.1	125	31.1
Never	-	-	-	-	220	54.8
Total	401	100	401	100	401	100

Relationship between Reading Interest and Use of Alternative Formats

The two hypotheses of the study are concerned with the possible significant relationship between the reading interests of and the use alternative format materials by the PVI.

Hypothesis 1: Reading interest of adult PVI will not have significant relationship with alternative format utilisation in the selected libraries.

In this hypothesis, the reading interest of adult PVI in the selected libraries was correlated with alternative formats utilization. The result showed Pearson correlation coefficient of 0.143, with a calculated probability of 0.014, which is less than the 0.05 significance level. Consequently, the null hypothesis was rejected. Accepted was the alternative hypothesis that the reading interest of adult PVI has no relationship with their utilisation of alternative formats in the libraries.

Table 4: Correlation between Reading Interest of Adult PVI and their use of Alternative Format Materials in the Selected Libraries

	Mean	*Standard deviation*
Reading interest	124.3535	12.4637
Alternative format utilisation	18.5556	2.3375

Pearson correlation results: r = -.143*; p = 0.014; N = 297.

* Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 2: Reading interest of secondary school PVI will not have significant relationship with alternative format utilisation in the selected libraries.

The reading interest of secondary school PVI in the selected libraries was correlated with their use of alternative format materials. The results showed Pearson Correlation Coefficient of 0.029, with a probability of 0.770, which is more than the 0.05 significance level. Consequently, the null hypothesis was accepted, i.e. that the reading interest of secondary school PVI has no relationship with their utilisation of alternative formats in the libraries.

Table 5: Correlation between Reading Interest of Secondary School PVI and their use of Alternative Format Materials in the Selected Libraries

	Mean	*Standard deviation*
Reading interest	46.9231	6.6430
Alternative format utilisation	9.3846	1.5157

Pearson correlation results: r = -0.029*; p = 0.770; N = 104.

* Correlation is NOT significant at the 0.05 level (2-tailed).

Discussion

There is a consensus among authors that the reading interests of PVI are varied, and the results of this study confirm this, although also found out were areas of high and low reading interest. Adult PVI in this study showed that they are mainly interested in religious, business/entrepreneurial materials, entertainment, reference sources, manuals, biography and poetry. This is in contrast with the findings of Horten and Horten (1995), Kimmins (1996) and Nielson (2005). This may be due to difference in educational level, environmental factors, economic and social status of respondents in these studies. Interest in religious materials could be attributed to the high religiosity of people in Nigeria and the worsening socio-economic realities in Nigeria, which have brought adult PVI (as much as other people) closer to God as a source of hope. Also, the adult PVI were much less interested in natural science, politics and community events, which again are not in consonance with the findings of Thomason (1993) and Nielson (2005). These respondents may be less interested in natural science materials possibly because they do not like science, or because scientific subjects are not very popular in the Nigerian society, or because scientific objects, symbols and diagram have not been well captured by the alternative formats provided by the libraries. Materials/stories on community events or happenings may not interest PVI because of their emotional reaction to the general negative or inadequate positive attitudes towards the blind and other visually impaired persons in the Nigerian society.

The secondary school PVI showed high interest in arts related subject areas, reference sources, short stories (animal, school and family) and sports. This is in conformity with the findings of Bachmutskaya and Yankova (1996) in a study of Russian children. However, it conflicts with that of Thomason (1993), who reported that high school students in an American city desire science fiction, adventure and mysteries. They were not much interested in natural science and science fiction. The findings of secondary school PVI in this study could be attributed to the unavailability of science and technology- based materials in alternative format which, in turn, could be due to the difficulty of effective transcription of such materials into alternative formats. Science materials are replete with illustrations, symbols and other technical drawings, which are not easily transcribed.

As observed from the results, the most frequently used alternative format among PVI in the libraries was Braille, followed by talking books or tape recordings, and large prints. This contrasted with the findings of Anne (2000) who reported that only 19% of Canadian college students who are visually impaired used Braille frequently, and also that of Davis, Wisdom and Greaser (2001) who reported that 83% of blind adults and partially sighted persons used tape recording in the UK. The preference for talking books in these countries may be due to ease of use and availability of technology to produce and use talking books (even in digital format), and the prevalence of innovative audio-based media services such as the Talking Newspaper services in the UK (Craddock,1996).

Studies emanating from the developed countries such as the National Library of Canada (1996) and Bruce, McKennel and Walker (1991), revealed that there is only a small demand for Braille by borrowers and buyers, and that talking books are more frequently used than materials in Braille and large print. The reason for Braille being the most utilised format in this study is likely because the use of other alternative formats is limited by their low availability.

On the relationship between reading interest of adult PVI and alternative formats utilization in the libraries surveyed, the study found that the reading interest of adult PVI had a significant relationship with their rate of utilisation of alternative format. By contrast, the reading interest of secondary school PVI did not bear a significant relationship with their rate of utilisation of alternative format. The reason for the different results could be that for secondary school students who are likely to need to read for mandatory schooling-related work, their use of alternative format is dictated less by choice of optional reading interests and more by the demands of the school work and subjects. However, adults have choice in what they may want to read, so their self-chosen reading interests would correlate with and influence or be influenced by their optional use of alternative format materials. In other words, for adult PVI the utilisation of alternative format will be driven by their reading self-chosen interests and vice versa, whereas for young schooling PVI, their utilisation of alternative material would be influenced more by the availability of the materials and less by their school-prescribed reading interests.

The finding of CNIB (2005) showed that visually impaired children in Canada often want to read alternative materials if these are provided in their areas of interest. The import of the findings of this study and those of CNIB is that both adult and young PVI would want to use alternative format materials in their areas of reading interests if they can find libraries or institutions that provide such materials. However, where the materials are not available or are inadequate, some PVI, particularly the young, may not be aware or able to ask for them. The inadequate availability challenge may also not be recognised by libraries, particularly in developing countries such as Nigeria, if young schooling PVI are unable to voice their frustrations with the challenge. The implication of this, and that of the information utility theory that underpinned conceptualisation of this study, is that Nigerian libraries have to strategise to acquire or produce adequate materials in alternative formats relevant to the preferences of PVI, and disseminate adequate information on the availability of the materials in the libraries, selectively educate the PVI on their rights as citizens to demand for such services.

Conclusion and Recommendations

The reading interests of PVI in the libraries surveyed were varied, while their use of alternative materials was dominated by Braille materials with much to be desired for large print and talking books. The low use of large print and talking books could be due to their low availability in the libraries which prevents PVI from using them. The satisfaction of the reading interests of PVI in the libraries studied is clearly crucial to utilisation of the alternative materials, as well as the attainment of the objective alternative materials provision in the libraries. In conclusion, the findings of this and other studies have shown clearly that the following variables (emphasised in italics) can and should be managed properly by Nigerian libraries in order to ensure adequate utilisation of the materials by PVI: provision of reading materials in the *subject interest areas* of the PVI; availability of the materials in the *alternate formats preferred* by the PVI*; availability of the materials* in libraries, and *awareness and knowledge* by PVI of the availability and their rights and choices. These variables are particularly important because of the current situation in Nigeria where alternate materials for PVI in Nigeria are inadequate, dispersed and uncoordinated across various institutions with diverse agenda for the selection and production of alternative format materials. The situation in Nigeria is however not peculiar, as the same conclusion was reached by Kinnell and Creaser (2001) in their assessment of public library services in the UK.

The study recommends that information materials in alternative formats for PVI in libraries should be provided first and foremost to meet their reading interests. Libraries providing information services to PVI should collaborate and share resources in order to increase the utilisation of alternative formats. The reading interests and information needs of PVI should be investigated periodically and adequately considered by libraries before information materials are acquired or converted into alternative formats for use.

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Dr. 'Niran Adetoro is Associate Professor and Head, Department of Library and Information Science, Tai Solarin University of Education, Ijagun, Ijebu-Ode, Ogun-State, Nigeria. Dr. Adetoro holds Dip.Lib, B.Ed (Hons), MLS and Ph.D Library and Information Science from the University of Ibadan, Nigeria. His research interests include psychology of information, information services to the visually impaired, and information technology and management.

Morayo Atinmo is Professor at the Department of Library, Archival and Information Studies, University of Ibadan, Nigeria. She holds B.A (Hons), MLS from Syracuse University, New York and a PhD from the University of Ibadan, Nigeria. Her research interests include user studies, information services to specialised groups, and organisation of knowledge.

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A Study of the Reading Interests of Graduates on National Service Scheme in Ghana

Olive Akpebu Adjah
Institute of African Studies Library,
University of Ghana, Legon, Ghana
oadjah@libr.ug.edu.gh

Abstract

A highly educated person, such as a university graduate, is normally expected to continue to read on diverse subjects as a desirable lifelong activity. Any such person who deviates from this behaviour is considered to have transformed into an aliterate. Against this background, using the survey design and the random sampling technique, this study sought to find out if fresh graduates of tertiary institutions are reading immediately out of school or are already exhibiting signs of heading towards aliteracy. Graduates of Ghanaian tertiary institutions who graduated in 2009 and were serving the nation under the Ghana National Service Scheme formed the population of the study. Two hundred copies of a designed questionnaire were distributed to such graduates serving at the University of Ghana between June and July 2010, out of which 167 usable copies were returned for a response rate of 83.5%. The study found out that the majority of the respondents were still reading, and also perceived reading as essential for lifelong learning. However, it does not appear that they placed as much premium on reading as they did in school. The paper calls on academic libraries to pay attention to providing resources and services to improve the leisurely reading habits of their students, alongside academic reading requirements, so that students leave the university with acquired and cultivated habits of reading outside of academic requirements and settings.

Introduction

Reading has a relatively short history in Africa (Chakava, 1996). Africa is commonly referred to as the "oral continent" (Finnegan, 2007); and in the traditional African society, information, usually stored in wise sayings, songs, stories, myths, fable, poetry, and proverbs, is most often transmitted or handed down by word of mouth. Unlike in a classroom, with syllabus, uniforms and permanent teachers, adult members of society serve as teachers because most Africans believe that knowledge and wisdom come with age.

The usual setting is for a child or adolescent to sit quietly beside elders, listening attentively, observing adult behaviour, hands-on training and/or co-joint activities to learn the process of any task or skill. In the usual African household, girls learned chores from elder female members and boys from the male members of the household. If a young adult wanted to learn a trade or profession, for example, dress making, craft work, trading, and so on, they were sent off to live with skilled members of the community. In a typical traditional society, a younger person who asks too many questions and argues is seen as disrespectful or precocious. Children are taught to be humble and to respect authority by submitting to decisions of the elderly without questions. This did not encourage the development of an inquiring mind because younger generations looked up to oral communication with the elders in the community for information and knowledge. Another limitation to this form of education and knowledge transfer is the absence of writings or records. Both limitations hampered the need and motivation to read or write.

The modernisation of African societies since colonial times brought with it literacy programmes, educational systems and students at the primary, secondary, tertiary and other levels. These systems naturally expect students to read extensively, intensively and frequently in order to gain information and improve their knowledge. However, many studies, including Applegate and Applegate (2004), Gebhard (2006), Nathanson, Pruslow and Levitt (2008), have reported that students described reading in terms of a chore or academic mandate. The students' responses reflect their conviction that reading is an obligation and an academic survival skill which, according to Mullan (2010), accounts for reading remaining a relatively marginal activity in the daily lives of many young people after schooling. This point is reiterated by Hughes-Hassell and Rodge (2007) that many adolescents hit a "literacy ceiling' when they reach middle and high school. They are unable or unwilling to access information in printed books resulting in frustration. Students then come to think of themselves as non-readers or poor readers and eventually avoid reading.

Furthermore, educated people may also face another reading-related problem that is known as aliteracy. Lary Mikulecky coined the term aliteracy in 1978, to describe capable readers who choose not to read, which Goodwin (1996) defines as the lack of reading habits in capable readers. A highly educated person, such as a university graduate, is normally expected to continue to read on diverse subjects as a desirable lifelong activity. An aliterate, therefore, is considered as one who deviates from a culture that considers a literate life as normal, desirable and good. In Ramsay's (2002) opinion, an aliterate should also be viewed from the point of a struggling, slow, frustrated reader who reads despite the feeling of enormous stress, confusion and pressure. This translates into a picture of a reluctant reader who in life will read what must be read but no more and, if at all, write using debased forms such as text messaging (Gorman 2005). Against this backdrop, Filicanevo (2007) warns that aliteracy will become an even bigger problem than it is today if the trend continues to grow unchecked. It would pose a bigger problem, because it breeds illiteracy and, according to Gallagher (2009), systematically kills the love for reading. Law (2010) laments that we are close to a world of aliteracy, wherein adequate reading and writing for appropriate lifelong learning are becoming optional and unloved, even among previously highly educated people.

Problem Statement

Azu (1994) commented that the premium put on literacy and reading by education systems has gradually eroded the traditional authority held by the elders as custodians and communicators of knowledge in African societies. However, the literacy and reading skills that were expected to supplant these traditional forms of communication are themselves being affected by the gradual relapse of educated people into aliteracy. Chakava (1996) and Olufowobi and Makinde (2011) even state categorically that most Africans do not continue reading after formal education is completed. Chakava (1996) argues that this was because when the book was introduced in Africa, reading was not promoted as an activity one could engage in for pleasure. People were forced to read and most of what they read were strange and contradicted their own beliefs, therefore they learnt to endure reading, but did not read for pleasure. The problem is further exacerbated by the rapid growth and popularity of modern technology-driven modes of communication that do not require much reading and writing, such as radio, TV, the Internet and mobile phones.

Objectives

Against this background, this paper reports the findings from a survey of fresh graduates of tertiary institutions to find out if they are reading immediately out of school or are already exhibiting signs of heading towards aliteracy. By so doing, the study sought to investigate the suggestion by Priyanto (2007) that the world of librarianship should go beyond the confines of the library to understand things surrounding it, more especially the population that community or public libraries serve. He states that issues such as the literacy, illiteracy, reading habits and aliteracy of library users should be investigated and considered in terms of how they affect a library and how it should respond appropriately with improved services. Finally, the paper also intends to offer recommendations to enhance the reading habits of graduates of tertiary institutions to promote their lifelong learning.

Methodology

The survey research method was used in the study, which was carried out between June and July 2010. Graduates of Ghanaian tertiary institutions who graduated in the previous year (2009) and were serving the nation under the Ghana National Service Scheme formed the population of the study. The University of Ghana, Legon, was chosen as the research site because it is one of the sites that receive graduates of various disciplinary and tertiary institution backgrounds. The total number of national service persons at the university at the time of the study was 701, and a sample of 200 was decided upon as an adequate sampling depth. Three faculties in the university, namely: Science, Arts, and Social Studies, were targeted for the sampling of the national service persons.

A five-page, 20-item questionnaire, titled ‘Reading Interests of New Graduates’, containing both closed and open-ended questions, was the main data collection instrument. Questions focused on factors relating to what the respondents read in school and are reading outside of school, sources of the reading materials, preferred formats of reading materials, and how they spend their leisure time. Other questions pertained to sources they consult when they need information, what they think about reading as a lifelong activity, and what kind of materials one should read as a lifelong activity. There were also questions that sought to find out the value they place on books by asking if they give or would give them out as valuable gifts during birthdays and weddings. Respondents had the opportunity to select their responses and use the open-ended questions to write additional information.

Permission and approval was sought from the University of Ghana’s Human Resource and Organization Development Directorate in order to motivate the support and active participation of the national service persons in the study. The list of the service persons was obtained from the Directorate, and respondents were assured that their responses would remain anonymous. Out of the 200 copies of the questionnaire that were distributed, 167 were retrieved and found usable, for a response rate of 83.5%.

Profile of the Respondents

The 167 respondents comprised two main categories: those who helped faculty in teaching or research (43%), and those who did administrative and other professional duties (57%). The gender composition was 68 (41%) females and 99 (59%) males. Respondents ranged in age from 20 to 40, with the preponderant majority (69%) within the 21 to 25 years age bracket (Table 1).

Table 1: Age of the Respondents

Age	Frequency	Percentage
Below 20	2	1
21-25	115	69
26-30	36	22
31-35	10	6
36-40	2	1
Above 40	2	1
Total	**166**	**100**

Source: Field Survey, 2010

Graduates from the University of Ghana formed the bulk (83%) of the respondents. Others were from Kwame Nkrumah University of Science and Technology (5), University of Cape Coast (4), Accra Polytechnic (11), Institute of Professional Studies (2), and a respondent each from Kumasi Polytechnic, Cape Coast Polytechnic, Korlebu, Narbita College, Central University College, all in Ghana, and the University of Wales. UK.

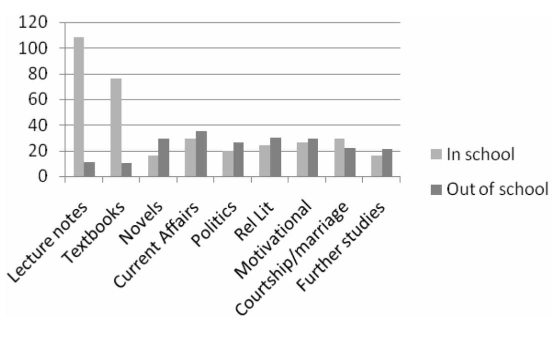
Results and Discussion

Reading Interests

In order to provide relevant and adequate information on reading interests in and out of school, respondents were asked to rate in order of preference how much of lecture notes, textbooks, novels, motivational books, materials for further studies, and on political issues, religious matters and current affairs they read in school, and were being read out of school.

As indicated in Figure 1, while in school, 102 (65%) of respondents read mainly their lecture notes, followed by 76 (46%) respondents who read textbooks. These findings suggest that the respondents did not make much attempt to look for other sources of information beyond what they received from their lecturers. The finding in respect of lecture notes is consistent with that of Oyewumi and Ebijuwa (2009) and Edem and Ofre (2010) that the majority of students read their lecture notes and handouts with the main purpose of passing their examinations, while very few read to satisfy recreational interests or intellectual curiosity. Oyewumi and Ebijuwa (2009) reported that 67% of their respondents used the library to read lecture notes, and the same percentage stated that they are motivated to read because of examinations. The other rankings after lecture notes and textbooks are as follows: materials on courtship, marriage and relationships(17%), and current affairs (17%) of the respondents, respectively; motivational books (16%), religious books (14%), political issues (12%), and novels and for further studies (6% respectively). It would have been interesting to find out why materials on marriage and courtship attracted the third highest position in the ranking. But it could mean that many of the respondents were, while in school, looking forward to marriage as probably the next stage in their rites of passage in life.

The respondents were asked to rank the same materials out of school in terms of their reading emphasis. Expectedly, the least read were lecture notes (7%) and textbooks (6%). The number who still read textbooks could be graduates who help teach as part of their national service duties. The responses also show that out-of-school reading of the graduated shifted to materials that provide information on current affairs (21% of the respondents), religious literature (18%), motivational books (17%), novels (17%), political issues (16%), courtship and marriage (13%), and further studies (13%).



Source: Field survey, 2010

Figure 1: **Reading interest**

Time Spent Reading

Having established what respondents were reading in and out of school, the study attempted to find out if they were spending as much time reading as they did when in school. The respondents were requested to respond "yes" or "no" to a question on where they were spending as much time. The majority of the respondents (53.6%) indicated that they did not place as much emphasis on reading as they did when they were in school. These findings are similar to what Salter and Brook (2007) observed in their study that students are most likely to read when engaged in an academic setting and less likely to read outside that environment.

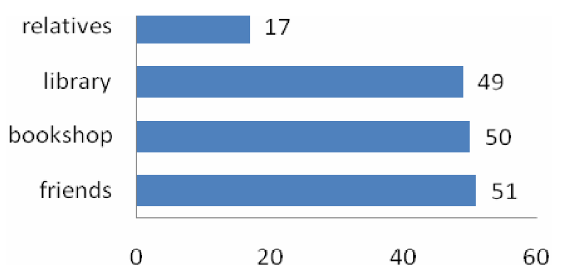
In an open-ended response, as to why they do not read that much, reasons stated are that they get tired after work (30.6%); they have more pressing things to do (6%); it is boring (6%); need more time for oneself (2.4%); have no interest in reading anymore (1.8%); there are less things to study (1.2%); and no pressure on one to read (1.2%). Other responses were that particular types of books are difficult to come by or in other words there is nothing to read (1.2%), need to rest the brain (1.2%), no examinations (4.2%), no lecture notes to read (3.6%), no good libraries (6%), economic and social challenges (6%), pressure from work and motherhood (1.2%) and laziness (6%).

On the other hand, 46.4% of the population who claimed they still read, as much as they did when they were in school, did so because they had access to books and had enough time to read (3.6%); they had examinations to write (6%), and because education has no end (6%). Some read out of habit (5.4%); and 10.8% read because their job demands that they read. Some (15.0%); believed they must read to broaden their knowledge, and 6% because of capacity building. Some stated they read for pleasure (1.2%), and 1.8% read because they wished to further their education.

Source of Reading Materials

Attempt was made to find out where respondents obtained their reading materials. This was in order to find out if they were using libraries as one of their main sources of reading materials (Figure 2). About the same number of the respondents indicated that friends (31%), bookshop (30%), and library (29%)

were the major sources of the materials that they read. Relatives came a distant fourth at 10% of the respondents. These findings support Rothbauer's (2009) argument that choice of reading materials is usually influenced by trusted sources or people one meets on a nearly daily-basis who are also likely to provide new materials, such as friends, libraries or bookshops. The findings also show that many of the graduates were purchasing or would purchase books for their own reading purposes, if they cannot obtain them from friends or libraries. The respondents who indicated library as their source of materials shows that the graduates, only recently out of school, continue to value libraries as their source of reading materials, as much as friends and the bookshop.



Source: Field survey, 2010.

Figure 2: **Source of reading materials**

Format of Reading Materials

From table 2, it is observed that 62.3% of the respondents preferred print documents, 29.2% preferred electronic materials, and 8.4% were comfortable with both formats. The reason they provided for their preferences included : print materials are very convenient because they are easy to carry about (33%); one could read the print format anywhere in bed, in a car, and even during power outages; print formats of documents are easily accessible (24%); print documents are easier to read (14.4%); one can always refer to, highlight important points and even write short notes in the document (3%); keep a copy for one oneself (3%). Some respondents (17.3%) claimed that they avoided electronic format of reading materials for health reasons stating that they wish to avoid the strain on their eyes due to prolonged use of the computer. Three (3%) respondents, respectively, noted that print documents are less expensive, and that they are more familiar with print format.

The 49 (29.3%) respondents who preferred information in electronic format gave the following reasons: it is easily accessible (47%); concise (2%); entertaining (14.2%); interactive (2%); easy to navigate (6%); cheaper (6%); concise, fast and gives access to current information, which enhances research (27%). One interesting comment was that electronic sources of information "store a lot of documents which you can use without using the library". However, fourteen respondents (8.4%) wrote that one could get variety and more information from both formats, and that both print and electronic materials are accessible.

Table 2: Format of reading materials

Format	Respondents	Percentage
Electronic	49	29.3%
Print	104	62.3%
Both	14	8.4%
Total	**167**	**100%**

Source: Field survey, 2010.

Use of Leisure Time

The results and discussion presented so far show that the graduates continued to read after school. Attempt was then made to find out how respondents spend their leisure periods on reading in comparison to other demands on their leisure time. The respondents were asked to rank reading, watching movies, listening to music, chatting with friends, browsing the internet and visiting the shopping mall in order of preference (Figure 3).

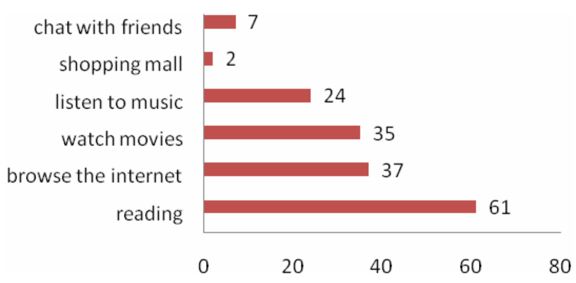
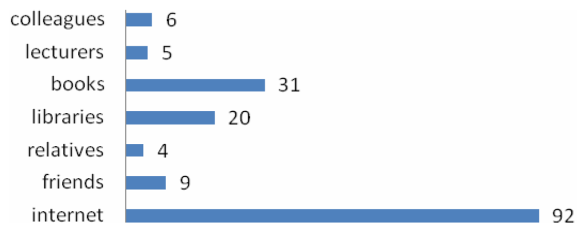


Figure 3: **Use of Leisure Time**



Source: Field survey, 2010.

Figure 4: Sources of information

Most of the respondents (37%) indicated that they spent their leisure periods reading; 22% would prefer to browse the Internet; 21% would watch movies; 14% would prefer to listen to music; and 1% respondents would prefer to visit a shopping mall. This is very encouraging as it suggests that respondents have high interest to read. These findings vary from those of Salter and Brook (2007), Gambrell (2008) and Chukwumah and Amalaha (2010) which reported that their respondents preferred to participate in visual activities (watching television, videos and DVDs), activities that were affecting their reading time adversely. This may be because the fresh graduates were only recently out of school, and were yet to lose the zeal for reading that they cultivated while in school.

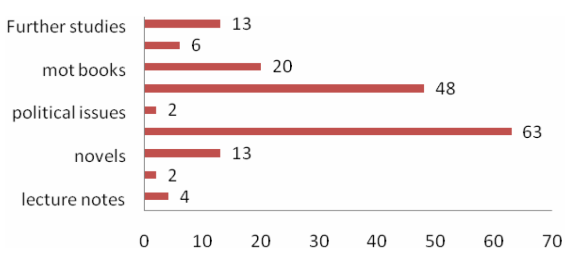
Sources of Information

Attempt was made in the survey to find out respondents' sources of information (Figure 4). If they have any information need, what sources do they consult? They were asked to rank friends, relatives, libraries, books, internet, lecturers, and colleagues in order of preference.

Majority of respondents (55%) indicated the Internet as their first choice, while fewer respondents chose books (19%), libraries (12%), friends (5%), colleagues (4%), lecturers (3%), and relatives (2%). However, the survey did not ascertain what sources or materials the 55% of the respondents who chose the Internet consulted, considering that there are electronic formats of books, journals, magazines and newspapers available online. The Internet is a useful source of information, which allows users to have faster access to information. In spite of the benefits, however, there is growing concern of its adverse effect on reading and the use of materials outside the Internet. If the reason for using the Internet is the speed with which information can be accessed, then there is cause for alarm. This is because, according to Agee (2005) and Law (2010), many young people prefer to gather information from sources such as the television, radio and the computer because of the speed with which information is obtained, at a click of a mouse, switching to a radio or TV station, or after typing in a few search words on the computer keyboard. Looking for information this way demands little actual reading and comprehension, suggesting that respondents do not invest as much time in searching for, reading and evaluating information as they would with printed materials. Browsing information is not the same as reading for information. Agee (2005) goes on further to state that the print format is being challenged, and reading is gradually being pushed out of the society because reading requires patience, learning and frequent practice on the individual level. Edem and Ofre (2010) reiterate this in a study, that the readymade answers that the Internet seems to offer students do not encourage them to use printed books and journals or even use the libraries to access books and journals. Law (2011) also laments that even after finding information online, users will only read short articles or just abstracts. In other words, the briefer the text, the more likely it is to be read.

Perception, Reasons and Materials for Reading as Lifelong Activity

The study established that the respondents considered reading to be a necessary lifelong activity as indicated by 96% of them. They were also asked to rank desirability for lifelong reading activity of materials on further studies, family life, motivational advice, religion, political issues, current affairs, and novels, school textbooks and lecture notes. Figure 5 presents their responses in respect of the different materials.



Source: Field survey, 2010.

Figure 5: **Materials for lifelong learning**

Majority (38%) of the respondents ranked materials on current affairs as most important for lifelong learning, followed by religious literature (29%), motivational books (12%), further studies (8%), novels (8%), family life (4%), and lecture notes, political issues and school textbooks (only 1% each).

On why the respondents considered reading to be a worthwhile lifelong activity, 35.9% of them indicated that reading gives access to information for development. Other reasons given were: it broadens the mind; it is educational and entertaining; one can learn a lot from books; it enables one to discover new things all the time; empowers one to acquire wisdom. Other provided reasons are: it gives one an edge over others because it is informative, insightful and makes room for further thinking; and improves and enhances language and vocabulary, which enhances one's work output. Some of the respondents believed that reading is one interesting and productive way of spending one's time because it makes one to become well informed and confident, while some others wrote that nobody can do without reading because learning never ends. One respondent commented that reading could even have therapeutic benefits for which reason it should be a lifelong activity**.** The few respondents (3%) who think reading should not be a lifelong activity stated that reading is not fun, it does not solve problems and that the brain should be allowed to rest.

Respondents were given the opportunity to comment further on the topic of lifelong reading, by asking about what they thought the library could do to help promote reading. Suggestions offered were that attention should be paid to promoting the culture of reading, that there should be extension services to encourage people to read the right kinds of books and not to rely solely on the Internet. Respondents also recommended that the libraries should stock current and interesting books and discard outdated books as they put readers off; that books should be provided to schools to inculcate reading habits; and that libraries should be provided in the rural areas.

Books as Birthday or Wedding Gifts

The survey attempted to find out specific behaviours by respondents might help propagate the need to read as a lifelong activity. Two questions put to respondents attempted to find out if respondents would give out books as "valuable" gifts in the eyes of both the giver and the receiver on special occasions such as birthday or wedding. According to Mann (1971), the book as a gift is an interesting phenomena since the "ownership of books confers status and therefore, to give books is also a status conferring action". One hundred and thirty-three respondents (82%) said they would give out books as birthday gifts as against 30 (18%) who said they would not. Respondents were asked if they would give out books as wedding present. One hundred and seven respondents (64%) said they would give out books as wedding presents and 60 (36%) said they would not.

Two of the reasons that respondents gave for not giving out books as a birthday presents or wedding gifts are: Africans do not cherish books; it is more common among Europeans, and not usual among Africans to give out books on such occasions. During weddings in most parts of Ghana, one is sure to find drinking glasses, wall clocks, kitchen accessories and wall hangings forming the majority of presents. This may be due to the home-making values that Ghanaian society place on weddings. That possibly also explains the reduction in number of respondents who were willing to give out books as birthday presents (82%) as against wedding presents (64%). It could also be because birthdays are seen by some people as more individualistic, just like reading, than weddings. Other respondents will not give out books as birthday gifts or wedding presents because they are not sure the recipients will read, or that they thought the recipients would appreciate other gifts better than books. A respondent commented interestingly: "It has never crossed my mind to give out books as presents during such special occasions".

The other respondents would give out a book as a memorial (2.4%), a souvenir (2.4%), because they think it is the best treasure (34.2%), a source of wisdom (13.8%), or provides information which enriches knowledge (22.8%), or could change lives (6%). Respondents will give out books to encourage reading (6%) and share information (3.6%). The very low 6% who would give out books to encourage reading shows that the respondents did not consider it their responsibility to help promote the culture of reading in the society or even among their relatives and friends. But it can be perceived that if many people in a society begin to give out books as gifts at birthdays, weddings and other occasions such as Valentine's Day, Mother's Day etc, it could serve as a motivational lever to transform reading habits.

Recommendations

From this survey it appears that libraries have a role to play in ensuring that graduates do not fall into aliteracy. There are various activities librarians can provide in improving reading and preventing aliteracy. Thus, librarians, should spearhead the activities listed below:

- Librarians can begin by forging and strengthening relationships with various stakeholders in literacy and reading culture, including faculty of tertiary institutions. They could sensitise faculty at various forums, such as seminars and academic committee meetings, on the problems of aliteracy and the need to revisit educational methods to make reading an enjoyable daily life process that would contribute to lifelong learning. Libraries should also work with faculty and university administrators to ensure that book titles on reading lists are made available in libraries for students to go and consult, while the giving out of handouts should be discouraged. In that way, students may develop inquiring minds and lifelong self-motivated reading and writing skills and interests. Librarians should also partner with other stakeholders, such as education policy makers, appropriate government ministries, non-governmental agencies and media houses, to mount a sustained information literacy and reading advocacy campaigns, as well as promotion and extension services towards ensuring that students do not became alliterates after schooling.
- Libraries could have sections with familiar settings of the relaxed areas in homes, like the living room, with comfortable chairs, large enough for students to stretch out if need be.

The usual chairs and desk always bring to mind a classroom setting. The image of the library needs to be improved upon to position the library not only as a place to study and do researches, but also as a place of relaxation where one can sit to enjoy leisure reading. For example, in Brownless Biomedical Library, University of Melbourne, Australia the ground floor area was transformed to include a casual café-style space on entry, with booths and informal seating in vibrant colours. Students spoke positively about the new setting and called it "night club image" (Kent et al., 2011).

- Librarians need to educate students that there is more information available offline than online. Most people are under the impression that every piece of information is available on the web, so if it is not the web, then the document or the information does not exist. As Darnton (2011) argues, although it is said that the future is digital, it does not mean that the printed material will cease to be important. This argument supported by Law (2010), which noted that about 44% of websites disappear within a year and that more books are produced every year with only a tiny fraction of archival materials digitised. There is the need to educate students on proper balance between the use of printed and online materials and how to evaluate information from the Internet.

Conclusion

The population sampled does not fit entirely into the definitions of capable readers who chose not to read (Mikulecky, 1978); people who lack reading habits (Goodwin, 1996); or have lost reading habits but choose to read anyway (Ramsay, 2002). On the other hand, this same sample cannot be described as enthusiastic or avid readers but rather moderate to light readers, who even when they need to read or look for information would prefer information on the web. This raises a red flag, which will take the concerted efforts of librarians, the library associations, educationists, to ensure that this societal challenge is tackled effectively or risk having the aliteracy rate eventually surpassing the illiteracy rate.

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Mrs. Olive Akpebu Adjah is a senior assistant librarian in the Institute of African Studies Library, University of Ghana, Legon. She holds an MPhil in Library and Information Studies from the University of Ghana, Legon.

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The Development of Mathematics E-Learning Tool for Nigerian Senior Secondary Schools

Tolulope O. Awodeyi and Mutawakilu A. Tiamiyu
Africa Regional Centre for Information Science, University of Ibadan, Nigeria
ma.tiamiyu@ui.edu.ng
toluawodeyi@yahoo.com

Abstract

Electronic learning (E-learning) involves the use of information and communications technology (ICT) tools and systems in teaching and learning processes. Such tools are being rapidly deployed into the Nigerian higher educational system because of their pedagogical benefits. But there have been inadequate efforts to deploy such tools at the secondary schools in the country, where spectres of over-populated classrooms and escalating student-to-teacher ratios have contributed to the poor performances of students in the Senior Secondary School Certificate examinations, especially in mathematics. Towards contributing to the local Nigerian efforts in the development and utilisation of e-learning tools in Nigerian secondary schools, this research undertook the development of an e-learning application (E-Maths) to support the teaching and learning of some aspects of the mathematics syllabus of the West African Examinations Council. A survey of students in selected secondary schools had revealed that mathematics was the most challenging to learn. The research found out and recommended that, in view of the very limited networked and Internet-connected ICT infrastructure available to most Nigerian secondary schools at present, the application would be most useful in hybrid learning environments that combine face-to-face classroom instruction delivery with the application, using CD-ROM as the delivery medium.

Keywords

Electronic learning, Learning management system, Mathematics, Secondary education,

Introduction

The expansion in the ways Information Communications Technologies (ICTs) are being deployed has transformed virtually every sector of the world's growth and development. In particular, different ICTs are being rapidly integrated into educational systems in developed countries, and gradually in developing countries. Electronic learning (e-learning) refers to the use of various ICTs in teaching and learning and related education management processes. This may involve the use of generic software, such as word processors, spreadsheets, or graphics, statistics, email, web browsing or multimedia software on equally generic desktop computers or mobile devices such as mobile phones and tablets. It is increasingly also involving the use of computer-assisted instruction (CAI), computer-managed instruction (CMI) software or learning management systems (LMS) which are designed specifically to facilitate the delivery of, access to or management of the teaching and learning of some specific subjects. Such software is also increasingly being deployed and used in networked environments, such as campus or school networks, or the Internet. E-learning provides a flexible and potentially more efficient learning environment than traditional classrooms for rapidly growing and diverse communities of learners.

Ajelabi and Agbatogun (2010), citing Okebukola (2004), note that with the implementation of the UBE (Universal Basic Education) scheme in Nigeria, as many as 14 million students are expected to be enrolled into Nigerian secondary schools from 2008, out of the estimated population of 140 million of the country in 2006. In view of the expected explosion in enrolments and consequent increases in students-to-teacher ratios in classrooms, it has become necessary for education policy makers and school systems in the country to begin to harness effectively the opportunities that e-learning systems provide for tacking the challenge.

Problem Statement and Objectives

A number of Nigerian government secondary schools, many of which are located in rural areas, are geographically and socially isolated. Their students are often from low to middle income families, and this hampers the ability of the students to acquire text and reference books. Moreover, there is inadequate number of teachers of mathematics in these schools. For instance, in a community secondary school in Ibadan (Isebo Community Secondary School, Ibadan, Nigeria) where the lead author of this paper had volunteered as Mathematics teacher, it was observed that the school had just one transient National Youth Service Corps teacher handling all the three senior secondary arms in the school.

As Recesso (2001) pointed out, the various challenges that confront educational systems in developing countries, such as inadequate and poorly motivated teachers, inadequate books and poor learning environments, have collective adverse effects on student learning and achievement. The resultant poor performance for instance, is more critical in science and mathematics subjects. Recently, the West African Examination Council announced at a media briefing that out of the 1,135,557 students that sat for the May/June 2010 exams in Nigeria, only 337,071 or 24.94% obtained credits in subjects that included English Language and Mathematic, and that the 2009 result was only one per cent better (The Punch Newspaper, 2010). Considering the importance of these two subjects, and especially mathematics in the technological development of any nation, these figures are alarming, and demand urgent action. Nigeria is not alone in this abysmal performance. Indeed, the whole of Africa is affected. Lujara, Kissaka, Trojer and Mvungi (2007) reveal that for selected subjects for the years 1994 – 2005 in Tanzania, the average failure rates were more than 40%. Performance in mathematics was worst, with an average failure rate of 70%.

These challenges however provide broader lens of considering the potential use of ICT in education. In Nigeria, most private and many public secondary schools have acquired desktop computers for their students' use, although most of the computers lack appropriate computer-assisted or computer-management software, or content management systems for the teaching and learning of specific subjects in line with approved syllabuses. This research sought to contribute to solving the paucity of such ICT-based tools by designing a Mathematics e-learning tool that makes effective use of the limited available ICT resources in Nigerian secondary schools to improve the teaching and learning of Mathematics. The research aimed to develop a system that provides appropriate (i) modules for the update and use of learning materials on specific topics in secondary school mathematics; (ii) modules to manage users of the system when installed on a computer system or network; (iii) modules for monitoring and assessing students' learning progress; and (iv) mechanisms for protecting the database and the information stored.

Literature Review

E-Learning

According to Salawudeen (2006), Electronic Learning (E-Learning) technology is the convergence of learning process and the Internet, that is, online knowledge acquisition through the Internet or offline through a CD-ROM, cassette player or other means of storing digital audio or video. E-Learning can also refer to educational websites such as those offering learning scenarios, worksheets and interactive exercises for youths and children. Citing Hedge and Hayward (2004), Gunga (2010) posits that e-learning is an innovative approach for delivering electronically mediated, learner-centred and interactive learning environments to anyone, anyplace, anytime by utilizing the Internet and digital technologies..

Obashoro-John (2007) also notes that effective e-learning presupposes the ready availability and ready access by learners and teachers to the following technologies: multimedia CD-ROMs, MP3 players, websites, discussion boards, emails, computer-aided assessments, learning management software, blogs, etc. E-learning is often considered as a means of permitting access to learning by using any or all of the following technologies: TV, mobile phones, webcam, email, DVD/CD, audio/video tape, website, telephone, audio-conferencing, video conferencing, podcasting.

Allan (2008) highlights the expansion in the language of e-learning, along with some differences in opinions on what should or should not be considered as components and resources for e-learning. Some researchers hold the opinion that e-learning should not necessarily exclude the use of printed text for the delivery or access to learning materials. Others believe that inclusion of the Internet is not essential. Nevertheless, simply providing passive learning material that is electronically based, such as a PDF documents posted on the Internet, is not commonly considered e-learning, as it is similar to the simple provision of textual material with no opportunity for learners to ask questions or to enter into discussion.

Nichols (2003) contrasts e-learning with online learning and blended learning. He explains that online learning entails the use of e-learning tools in a distance education mode using the Web as the sole medium for all learning and student-teacher contact. He defines blended learning (also known as mixed-mode or resource-based learning) as an approach to education that combines face to face and distance approaches to education in which an instructor meets with students (either in a face to face mode or through a technological means) along with technology-delivered and accessed resource-base of content materials and learning activities for the use of the students.

Rationale, Challenges and Principles of E-Learning

Alexander (2001), citing Bates (1997), advances four reasons for using technology in higher education: to improve the quality of learning; to improve access to education and training; to reduce the costs of education; and to improve the cost-effectiveness of education. The following advantages of E-Learning compared to traditional classroom learning are often highlighted in the literature: cost savings, geographical reach, extensive use of multimedia, availability, portability, consistency, learner control, up-to-date content, no duplication, and shorter learning time (http://www.study-center.com/welearn.asp). Nevertheless, often also highlighted, as noted by DelVecchio and Loughney (2006), are the following challenges for students, teachers and educational administrators in the E-Learning environments: demand on teachers and students for adequate computer skills and effective online communication and writing skills; costs of ready and frequent access to and use of computers and the Internet on students; students' sense of isolation from their teachers and education systems; demand for students' self-motivation and drive to learn independently of the teacher; initial heavy demand for content development skills and time from teachers and instructors.

Content Management Systems

The earlier software tools for the learning and teaching of specific subjects and topics were known as Computer-Assisted Instruction and Computer Managed Instruction tools. However, the ultimate educational tools today are educational Content Management Systems (CMS), or more specifically, Learning Management Systems (LMS). All LMS, such as the commercial Blackboard and the open source Moodle (open source), share some common features. As explicated by Blackboard (2007, 2008), Rice (2006) and Cole and Foster (2007) for the Blackboard LMS and Moodle LMS respectively, the users are expected to use their browsers to navigate to the website of the LMS and log-in. There is usually a list of available classes that the student can click to access. That will load the virtual classroom in the student's browser. Here the student will access the various resources uploaded by the teacher starting from the syllabus and including lecture notes, articles, presentations, videos, images, web links and other types of files. There will be an area where the students can upload their assignments. Usually a discussion board is included, an area where the students can check their grades. There may be a calendar and support for Internet chat, email, and word processing. The LMS could contain parts that do not require the interaction with the teacher such as quizzes that are checked and graded by the LMS itself.

A major drawback of commercial LMS, such as Blackboard, is their high cost of acquisition and update. On the other hand, the commercial LMS are much significantly easier to use or manage than some free solutions. For most schools and universities, the popular open source choice is often Moodle LMS. In December 2010, there were 50,630 registered Moodle eLearning sites, 4,114,823 courses, and 39,381,043 users speaking over 70 languages (http://moodle.org/stats). Another open source alternative is Drupal, a free content management software distributed under the terms of the General Public

License that can be used to organise, manage and publish content in wide variety of environments. Although Drupal's user community is much less in size (630,000+ at 2012, http://www.drupal.org/) than claimed by Blackboard and Moodle, it is being used by organisations in a variety of sectors, including education. Another option is to build a "home grown" CMS, using freely available development tools. If the institution or school has in-house skills or is willing to hire outside contractors, a CMS could be built using, for example, Linux as the operating system, Apache as the web server, PHP as the programming language, and MySQL as the database engine. But such an approach can also be very expensive in terms of development time and resources.

E-Learning Opportunities and Trends in Africa

Lundy and Logan (2002) in exploring the key trends in E-Learning in Africa note that governments in emerging economies see e-learning as an attractive option for delivering the skills of the developed world to the developing one. They note that as fifty per cent of African countries have deregulated their telecommunications industries, which would be more infrastructure investment, improved telecommunications services, and greater prospects for e-learning initiatives and projects. They conclude that e-learning will become an imperative strategy for enterprises and governments to reskill, retool and generally keep pace with the changing technological and business environment.

However, despite the several reported positives of e-learning in developed countries, Gulati (2008), citing Leary and Berge (2006), stated that a review of 150 distance education programmes in sub-Saharan Africa revealed that traditional, paper-based means of distance learning are more reliable, sustainable, and widely used than online and Web-based methods. Gunga (2010) explains the situation in terms of the following challenges of e-learning in African schools: non inclusion of regular 'technology education' and 'technology teacher education' as core requirement in many systems of education in African countries; getting stuck in traditional teaching methodology due to static national policy on ICT, technology (teacher) education and digital inclusion; the costs of personal computer, laptop, software, Internet access and their technical support are high; although mobile technology is gaining ground widely, associated with it is high cost of usage, small screen size and low life of battery; inadequate or unreliable of electricity power supply in both urban and rural areas. Despite these and other challenges, Lundy and Logan (2002) opine that "e-learning opportunities need not depend on these changes or wait for them. Much of the infrastructure to deploy basic e-learning - sometimes only a stand-alone PC is required - exists in Africa right now."

There have been reported advances in e-learning in some African countries. Kalinga (2008) describes her work on the Development of an Interactive e-Learning Management System (e-LMS) for Tanzanian Secondary Schools. Lating (2006) reports a similar project in Uganda, describing the use of CD-ROMs to deliver learning material to schools without Internet connection in a "hybrid E-learning" which includes both on-line and off-line material. The hybrid E-learning project includes development of physics/chemistry/mathematics courseware out of local content (school teachers') materials and lecture notes, development of courseware for delivery through the Internet, making and delivering CD-ROMs to the schools.

E-Learning of Mathematics

The use of Virtual Learning Environments (VLEs) for the teaching of mathematics has been described in the scientific literature. For example Chinnappan (2006) for WebCT™ (now Vista), McClendon and McArdle (2002) for a system called ALEKS, while Dougiamas and Taylor (2003) investigated on-line classes that were built using the Moodle Content Management System (CMS). Moodle, Dillenbourg, Schneider, and Paraskevi (2002) discussed whether VLEs can really improve education and reduce its cost. The authors made the case that as with all previous technologies that were adopted by schools, it is the proper implementation of any of these technologies that will improve instruction. They stated that "media have no intrinsic effectiveness, only affordances." Chinnappan (2006) studied the implementation of WebCT for a group of beginner mathematics teachers. There are several other companies that sell CMS capable of providing on-line mathematics courses. For example, Apex Learning (http://www.apexlearning.com) sells a VLE that provides on-line based standard mathematics courses for grades 6 through 12, as well as courses in many other subjects.

Henri-Paul Indiognie (2008), in a review of Computer-Based Learning Technologies (CBT) for the learning and teaching of mathematics, identified and reviewed GeoGebra (available at http://www.geogebra.org/cms), which he describes as a free mathematics software that covers geometry, algebra and calculus and released under public general license for education in secondary schools.

In the African context, Liverpool, Marut, Ndam and Oti (n.d.) provide a model for the implementation of courseware development for e-Learning in Nigerian higher education institutions based on their experience in implementing an e-learning project in mathematics at the University of Jos, Nigeria. Lujara et al (2007) describe their work on the introduction of Open-Source e-Learning environment and resources for the Tanzanian secondary schools in Mathematics and Science subjects. They note that in Tanzania, for secondary schools e-learning, there is only one website with URL http://www.distancelearning-tz.org which provides notes for secondary schools in different subjects, and this website is maintained by a non-governmental organisation, International Institute for Communication and Development (IICD).

Tools, Methods and Materials

The present research made use of open source software (OSS) tools to develop a mathematics e-learning application (*E-Maths*) that enables the: (i) organisation and update of mathematics learning content to a database, (ii) provision of the application (comprising the interface, middleware and database) for deployment on CD-ROM or networks, and (iii) interactive self-paced use of the content by teachers and students in a hybrid classroom-online learning and teaching environment.

The following tools, methods and materials were used during the system analysis, design and implementation, and testing and evaluation of the application:

(1) Learning theories, pedagogical principles and instructional design principles from the literature to guide the design of e-learning application;

(2) Senior Secondary School mathematics syllabus approved by the West African Examinations Council (WAEC) (for the identification of approved mathematics topics and sub-topics);

(3) Lesson Notes obtained from a sample of teachers, using a participatory content acquisition approach (for the acquisition and development of learning contents and objects);

(4) Survey observations, interviews and questionnaire (for collecting data and information during the system analysis of pre-existing infrastructure, resources, conditions and processes in selected schools in Ibadan metropolis, Nigeria;

(5) Data flow diagrams (DFD) and System Flow Charts (SFC) tools (for describing the analysed and designed system components and processes;

(6) Sharable Content Object Reference Module (SCORM) and Instructional Management System (IMS) standards (for the structuring and packaging of mathematics learning content into learning objects);

(7) Drupal Learning Management System (for the structuring, update to database and use of learning content);

(8) WAMP (Windows, Apache, MySQL, PHP) technology rack (for the development and integration of the system's user interface, middleware and database);

(9) XHTML (eXtensible Hypertext Markup Language) and XML (eXtensible Markup Language) standards and codes (for displaying and interrelating textual and multimedia learning content objects);

(10) CD-ROM (for the distribution of the application, and the associated interactive multimedia help and training files; and

(11) Survey questionnaire (for collecting system evaluation data from pilot users - teachers and students of the *E-Maths* application.

System Analysis

The system analysis step in the development of *E-Maths* involved analysing the existing mode of teaching and learning of mathematics in senior secondary schools (SSS), identification of problems that teachers and students face, and identification of possible pedagogical and technological strategies, methods and tools for solving the problems.

Data collection

The following three survey methods were used in the investigation of the existing system:

Direct Observation: One of the researchers visited 14 different schools (10 public schools and 4 private schools) in the Ibadan metropolis to observe various activities, conditions of the classrooms, population of the classes. Also noted were the attitudes of the students and teachers to mathematics. The previous direct involvement of one of the researcher in the teaching of mathematics in a community secondary school helped tremendously.

Interviews: To authenticate the observations and the data from the questionnaire survey, the researcher conducted brief interviews of students and mathematics teachers in the selected public and private schools as the questionnaire was being completed by other sampled students. The student responses during the interviews showed that there were indeed mathematics topics that they found quite difficult to understand. Some students even had difficulty identifying the broad heading under which some topics belonged.

Questionnaire: All the 14 schools were also involved in the questionnaire survey. A short questionnaire to determine the most challenging mathematics topic was administered to sampled students and teachers. This was done in order to determine the topics that the e-learning system should focus upon. In order to ensure that the teachers did not feel threatened that the survey was questioning their capability to communicate well with their students, the researcher took the pains to explain to the teachers that the questionnaire was about identifying the subject that they had to explain over and again (and yet again) to the students before they understood (if they did). Two mathematics teachers (the average number per school) per school were sampled, for a total of 28 teachers. Furthermore, two students, a boy and a girl, from SS3 level in each of the sciences, commercial and arts classes section, for a total of six students from each school, and 74 students overall. The researcher walked the students through the student questionnaire slowly and ensured that each student completed it independently. Six students were selected from each school, randomly from the provided arm/class registers. In the very few cases where the selected SS3 students were not available they were excluded from the survey and analysis.

The surveys were carried out in March 2011, about four weeks to the start of the Senior Secondary School Certificate Examinations, and the best time to collect and elicit this kind of information, with the SSSCE timetable out, and mock examinations and preparations in full gear for the all stakeholders of the system. Accordingly, the questionnaire was designed to be simple and very short to hasten recovery time because the teachers and students were at a busy time of the school calendar.

Findings

The teaching and learning methods and conditions in the public schools that were surveyed epitomise the situation of most public schools in Nigeria. The teaching/learning infrastructure consists of wooden desks or long benches, chairs, black writing boards and white chalk. In most of the schools visited, there were as few as two mathematics teachers taking as many as four to six arms of the senior secondary school classes. This workload of the teachers was enormous, particularly as the teaching and learning of mathematics in these schools is completely manual. The private schools were ranged from being about the same to slightly and much better.

The existing system is the traditional classroom-centred, face-to-face approach, which is constrained by explosion in the number of students using the system without a commensurate increase in the number of teachers. The mathematics teachers on ground were not enough to handle effectively the numbers of students, and it is difficult for the teachers to give the individualised instruction that is fundamental to effective self-paced learning of mathematics for weak students. The interviews with teachers in the schools revealed that some of them had Bachelor of Science, not Bachelor of Education in Mathematics, degrees. Possibly because of the lack of training in educational pedagogy, these teachers were not able to determine themselves if any topics in mathematics were proving difficult for their students to learn.

On passing the Junior Secondary School Certificate Examinations (JSSCE), students are placed in the Sciences, Commercial and Arts and Commercial arms of schools on the basis of their performances in the examinations in that order, although there are a few exceptional cases where a student with very good performance may request to be placed in Commercial or even the Arts arm. Nevertheless, the students in all arms take mathematics under the same teaching and learning conditions and methods, irrespective of their JSSCE performances.

Figure 1 shows graphically the result of the analysis, which shows that the students found “Mensuration” as the most challenging topic in mathematics, followed by “Construction”, “Plane” and “Circle” in that order. Based on this particular finding, “Mensuration” was decided as the focus of the E-learning tool to be developed. Table 1, obtained from the Mathematics syllabus approved by the West African Examinations Council (WAEC), shows the sub-topics under Mensuration, which formed the scope of the learning content targeted by *E-Maths*.

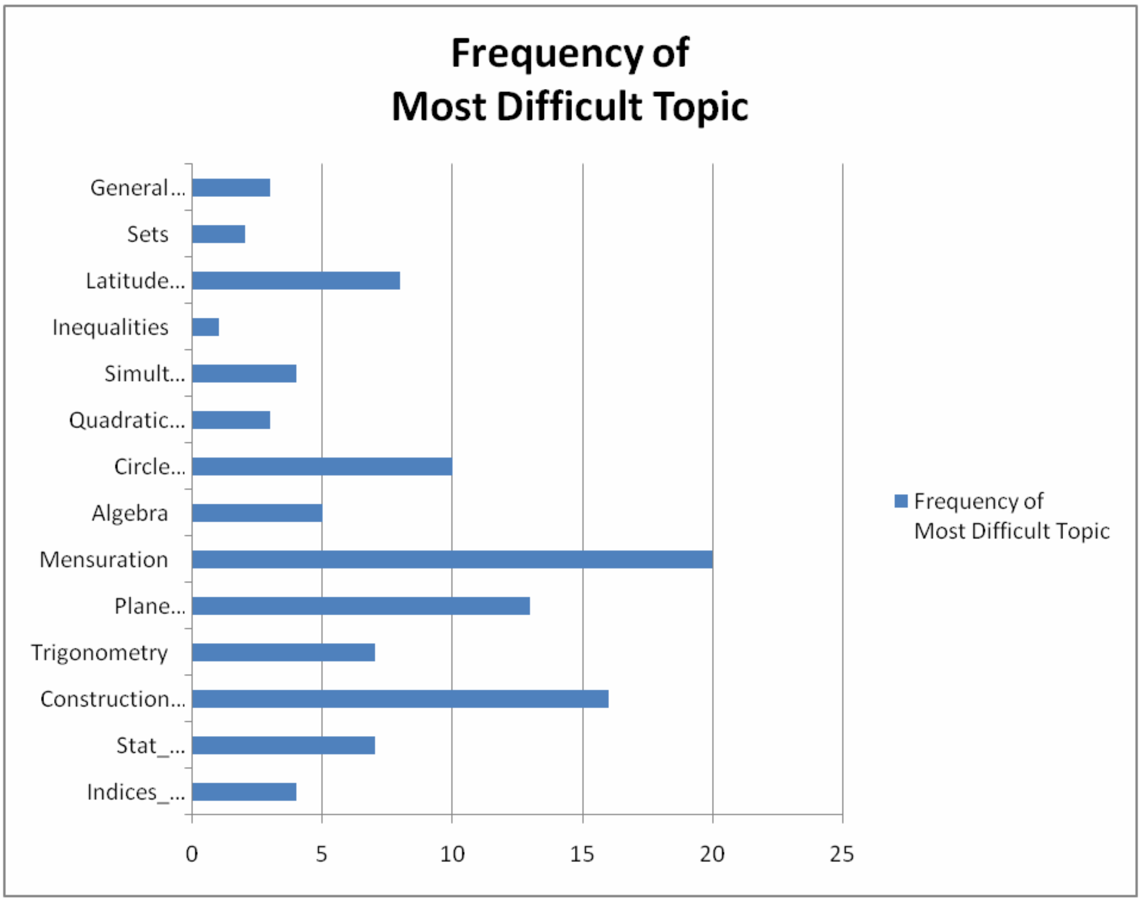

Figure 1: **Most Difficult Mathematics Topics**

Table 1: Sub-topics under Mensuration

Sub-topics	Contents	Notes
Lengths and Perimeters	Use of Pythagoras theorem, sine and cosine rules to determine lengths and distances.	No formal proofs of the theorem and rules are required.
	Lengths of arcs of circles. Perimeters of sectors and segments.	
	*Latitudes and Longitudes.	Distances along latitudes and longitudes and their corresponding angles.
Areas	Triangles and special quadrilaterals – rectangles, parallelograms and trapezia.	Areas of similar figures. Include area of triangles is ½ base x height and *1/2 abSin C. Areas of compound shapes. Relation between the sector of a circle and the surface area of a cone.
	Circles, sectors and segments of circles.	
	Surface areas of cube, cuboid, cylinder, right triangular prisms and cones. *Spheres.	
Volumes	Volumes of cubes, cuboid, cylinders, cones and right pyramids. * Spheres.	Volumes of compound shapes.
	Volumes of similar solids	

System Design

Systems design refers to the process and the steps that are involved in defining and articulating the components, modules, interfaces and data requirements needed for a system to satisfy specified requirements.

Design Philosophy and Objectives

The design philosophy aimed for a self learning environment to help students get control of a subject even in the absence of a teacher or during self study. The user interface was designed using instruction design principles to provide this facility. The design of the application aimed for specified target objectives for teachers and students of mathematics and the technical support personnel. For schools and mathematics teachers, the design objectives are: (i) inexpensive development (all the software needed for the creation of the mathematics e-learning tool should be available cheaply); (ii) rapid creation (teachers should be enabled to create their own e-learning content rapidly with the application). For mathematics students, the specified target objectives are: (i) ease of use (it should be very easy for a below average student to select a learning object module, learn the content, and assess him/herself; (ii) self-paced learning (the student can repeat a module as many times as are needed for him to understand any particular topic); (iii) improvement of students performance in mathematics, which is ultimately what the application aims to achieve. For the technical support staff that may be available in schools, the design objectives are: (i) shortened time needed for multimedia programming; (ii) ease of maintenance; (iii) flexible distribution and deployment through CD-ROM or networks.

Instructional Design

As the application is intended to deliver learning content, the directing principles and strategies for the content capture, storage, processing and presentation aspects of the design is Instructional Systems Design (ISD). ISD refers to the systematic guidelines instructional designers follow in order to create and deliver a workshop, a course, a curriculum, an instructional program, a training session, or the instructional materials and products for educational programs.

The design of the content delivery aspect of *E-Maths* was based on the core principles of the ADDIE (Analysis, Design, Development, Implementation, Evaluation) generic model for instruction system design (Molenda, 2003; Rao, 2010), and took into consideration the following: building on existing abilities and motivations of the students to pass mathematics and to use technology; creating challenges of increasing difficulty; adjusting the level of interactivity to accommodate the computer neophyte; provision of a means of measuring progress (assessment); incorporation of direct manipulation of elements (learning objects) by learners where possible; provision of sufficient review and practice; use of graphic elements to create an attractive, memorable and distinctive context.

Courseware Design

The system analysis revealed that the learning content provided by teachers of mathematics to their students are organised in lesson notes, with each lesson note structured into the following hierarchical levels of content: (1) Subject (i.e. Mathematics); (2) Topic (within subject); and (3) Sub-topic (within Topic).

In turn, each sub-topic has the following sections: (i) Reference Book (a textbook that provides the source of guidelines and content); (ii) Teaching aids (to be used by the teacher in the delivery of the content), (iii) Previous knowledge (usually in the form of preliminary questions or exercises to ascertain essential prerequisite knowledge); (iv) Objectives (i.e. learning objectives); (v) Introduction (this is usually a brief introduction to the topic, including scenario description to establish the importance of the topic and motivate the learners); (vi) Steps (i.e. specific instructional steps, from 1 to N, used to deliver the learning content to achieve the learning objectives); (vii) Conclusion (a summary of the topic); (viii) Evaluation (contains some questions or class work to ascertain that the learners have understood the sub-topic and that the learning objectives have been achieved); (ix) Assignment (to be done after the class). Accordingly, the courseware tree that was used in the design of the learning content of the e-learning application consists of four levels: Course, Topic, Sub-Topic, and Learning Object.

However, beyond the lesson notes, it was necessary to prepare and use specifications (learning outcomes and contents) that ensure coverage of the approved syllabus and the recommended learning objective/outcomes. This involved understanding and using the subsisting West African Examination Council (WAEC) Mathematics syllabus/curriculum, and the subsisting standard Mathematics text for senior secondary schools (New General Mathematics Books 1-3).

A Learning Object (LO) is a self-contained chunk of learning content focused on a specific learning objective. It can obtain text, video, images, a flash animation, etc. Learning objects may be seen as building blocks that can be combined in nearly infinite ways to construct collections that might be called lessons, modules or courses. (Kilby, 2002). The essence of using LOs is to increase learning effectiveness, ensure compliance with instructional design standards, and reduce development time and costs drastically.

The lesson plans and notes of the participating mathematics teachers were discussed with them and used to understand the order of presentation of topics, sub-topics and learning objects in the traditional classroom approach. The understanding was then used to design an Input Courseware Presentation Order (ICPO) for each learning module and unit. This is shown below in Figure 2. Next, the implementation of the ICPO as a courseware involved developing output screens to match each step in the ICPO, and ensuring: (a) the module title is to be displayed prominently and be as descriptive as possible; (b) the total text of each module is between 100 and 300 words, with less considered better, provided there is an adequate accompanying voice narrative; (c) the use of illustrations, graphics, animation and activity; (d) the enabling interactivity through drag and drop features, true/false statements, compare answers mechanisms, multiple choice quiz, etc.

Table 2: Steps/Screens in the Presentation of Learning Objects within Learning Module/ Unit

Step/Screen 1:	Present Title, Topic (and/or Subtopic)
Step/Screen 2:	Present Learning Objective
Step/Screen 3:	Present Concept/Idea. Provide its description.
Step/Screen 4:	Build on the description concept/idea presented
Step/Screen 5:	Provide example, and solution
Step/Screen 6:	Provide another example, and solution
Step/Screen 7:	Provide further optional examples and solutions of increasing difficulty
Step/Screen 8:	Provide Exercise 1, for Learner practice
Step/Screen 9:	Provide Exercise 2, to assess the Learner

Application Design

Architecture

The design of the *E-Maths* application adopted the basic three-tiered architecture, comprising the web client, web server and the database. The web client allows users to create, edit and access learning contents. The web server stores the script codes that provide links and communication between the application's interface and the database that stores the learning content.

Interface Design

The Welcome and Module Selection screen of the interface is as shown below in Figure 2. It incorporates an attractive, simple and easy-on-the-eye design. The colours used are bright colours. This is intentional, as teenagers (13 – 18 years) form the main age group of the senior secondary school students. Figures 3-5 provide snapshots of some of the screen sequences used for the delivery of the learning content and objects.

Application Development Tools and Processes

Figure 2(a): Welcome Screen

Figure 2(b): Module/topic selection page

Figure 3(a): Another expository page in the Latitude/ Longitude module

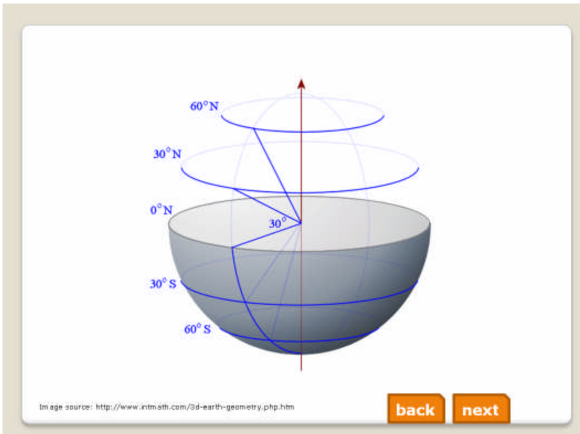

Figure 3(b): An expository page in the Latitude/ Longitude module

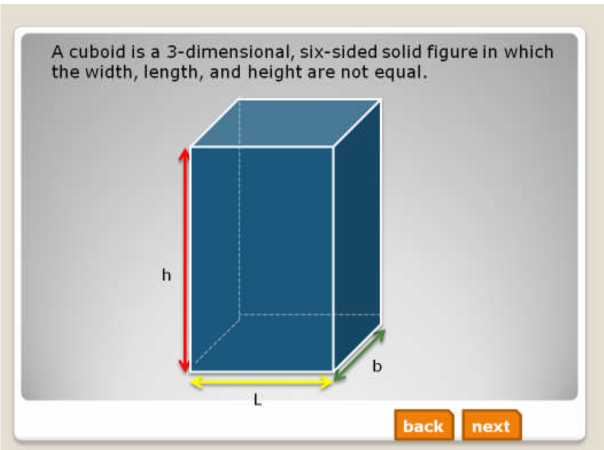

Figure 4(a): An animation in the Cuboids module

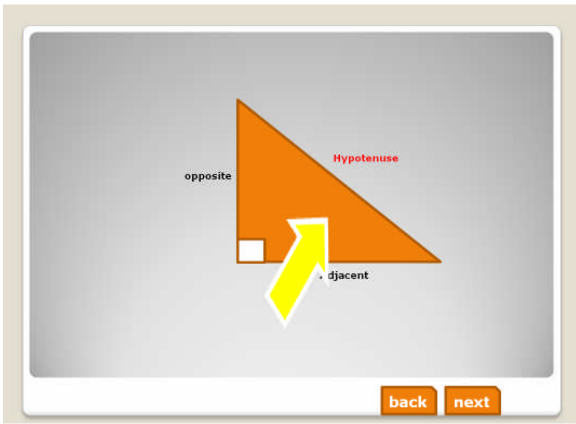

Figure 4(b): Animated sequence in progress in the Pythagoras' Theorem module

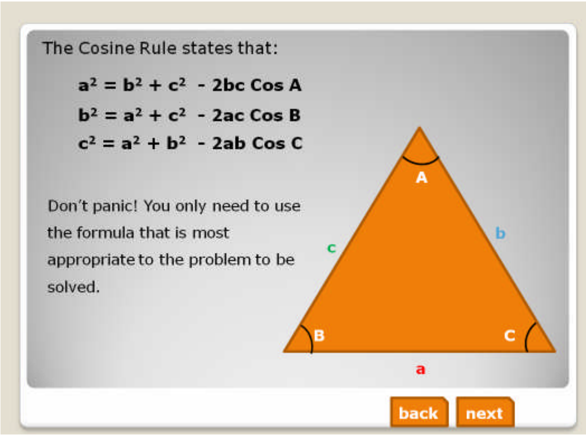

Figure 5(a): A sequence in the Cosine Rule module

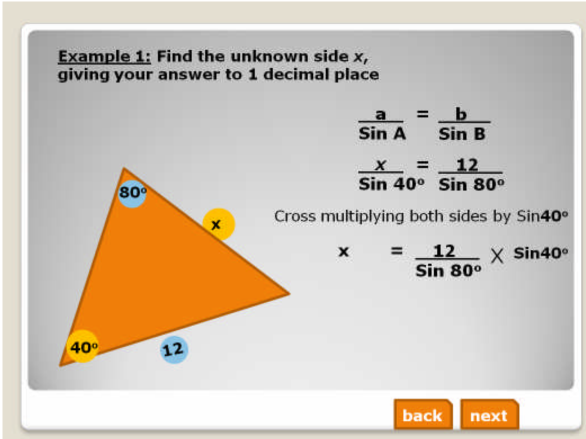

Figure 5(b): Animated sequence of an example in the Sine Rule module

Offline (CD-ROM based) and online (web-enabled) versions of *E-Maths* were developed. The hardware used is a laptop computer with the following configuration: Pentium M Intel Centrino dual core processor; 120GB of HDD; 1.0 GB RAM; 15.6" widescreen monitor; Mouse; Microsoft Windows 7 and Windows Vista operating systems; CD-Rewritable drive. The coding of the *E-Maths* application was initially started on a laptop running the Microsoft Windows Vista operating system (OS), and completed running the Microsoft Windows 7 OS.

Offline Version: The development of the offline CD-ROM version made use of the following tools: Adobe Flash (and Actionscript), Authorpoint, Articulate Presenter, Microsoft PowerPoint and Audacity tools. Adobe Flash (and ActionScript) was used to develop the assessment aspects of *E-Maths* (e-Learning tool). Also, due to its portability, reusability and the prevalent use of shockwave files (generated from Adobe Flash), this proved to be an important tool for cross-platform use. Authorpoint and Articulate Presenter are alternative rapid e-learning development tools used for converting files to the "swf" (shockwave or flash object) format. It accepts multimedia programming files as input. Microsoft PowerPoint was used, in conjunction with Adobe Flash, for the core multimedia programming requirements of the *E-Maths*. Audacity is an open source audio recording software that was used to capture, edit and embed sound files, and to convert into MP3 formats and other portable formats for use in the swf files obtained. The CD-ROM version of *E-Maths* entailed coding the data (courses and learning objects) into the program itself. The implication of this is that the offline version requires no login details, which would have required matching with data stored in a database. The user just plugs and plays the CD-ROM. The drawback, however, is that the learning objects in the CD-ROM version are read-only data that cannot be modified unless the CD-ROM version of the application itself is modified.

Online Version: An web-enabled version of *E-Maths* enables its deployment over a school LAN or the Internet. The development of the online version made use of PHP scripts, WAMP server, MySQL, and Drupal Content Management System. PHP, an acronym for Hypertext Preprocessor, was used to create dynamic web content, and to manipulate information held in the MySQL database. PHP code can be embedded in HTML or used in standalone applications. WAMP packages were installed on a computer running Microsoft Windows 7 operating system (O/S). WAMP is an acronym formed from the initials of the **W**indows O/S and its other principal components, **A**pache, **M**ySQL and **P**HP. WAMP is used during application development to create a web server environment on a PC. Apache is a web server, enabling a user on local host with a web browser to be able to connect to view information from the web server as web pages. Drupal was used to create, build and manage the website. It is a robust, open source content management system.

System Evaluation

According to Nielsen (2000), the best results of usability testing come from testing with no more than five users but running as many small tests as one can afford, and that one needs to test with at least 15 users to discover all the usability problems in the design. A preliminary evaluation of the operational use of *E-Maths* was undertaken by three groups of 23 evaluators: 10 senior secondary school students (SSS) (aged 14-18 years, seven female) from a private secondary school; eight SSS Level 3 students (aged 1-18, five female) from a public secondary school; five teachers, all from Ibadan, Oyo State, Nigeria. The students and teachers were asked to use and assess the application and complete an evaluation questionnaire.

All the students from the private secondary school claimed to have had experience using computers. They all agreed that the layout of *E-Maths* was clear, and that the tool was easy to use, start and stop. They also reported that they found the tool easy to navigate, that the language understandable and the grammar accurate, and that the graphics, animation and accompanying audio sound were relevant, adequate and aided their understanding. They indicated that they liked the fact that the tool was easy to understand and an aid to topic comprehension, and was a time saver (each module took between 10-15 minutes to learn). They however expressed dissatisfaction that the audio was not loud enough, that time transition between pages was too fast which did not allow them to jot down ideas gained while learning the content. They felt the examples and exercises used were too simple, and suggested that more difficult examples and more topics (like surds, bearings, circle theorem, quadratic equations, angles of elevation and depression) be included.

Three male students and one of the five female students (among the eight students from the public school) claimed to have had experience using computers. The majority of them agreed that the layout of *E-Maths* was clear, and that the tool was easy to use, start and stop. They also reported that they found the interface easy to understand, with the graphics and animation relevant and aiding understanding. All of them were excited and impressed with the tool. They found it quite easy to understand and very relevant, and the diagrams quite explanatory. But they were also dissatisfied with the low sound output, and the speed of transiting from one page in the module to the next. They also wanted the solutions to the exercises to be more detailed and better expressed. They suggested that the audio quality and loudness be improved, with more detailed and well expressed solutions, and more topics covered (like probability, circle geometry, bearings and distances, etc).

The teachers (third group) were a bit elusive. They were either too ‘busy’ or wanted to give that impression. Their comments were constructive but with mixed reactions. *E-Maths* was called “highly commendable”, clear and making for easy understanding and aiding visualisation. It should be noted that most students find mathematics difficult because they find it abstract and not easy to visualise. They suggested adapting/packaging it for viewing on the television via CD/VCD players, inclusion of more topics and more exercises and tougher examples and worked exercises, solutions steps written on the screen along with the audio explanations; inclusion more interactivity to reduce passive listening on the part of the students.

These are observations which are now being used to improve the content delivery quality of *E-Maths*.

System Deployment

E-Maths is designed to be deployed for use in versions: (1) Deployed and accessed directly from a CD-ROM. This is the preferred mode of delivery, as the majority of the secondary schools who are the intended users may have standalone computers but lack LAN facilities or Internet access. (2) Deployed and accessed from a server in an Intranet or the internet. This version enables *E-Maths* to be used in a WAMP environment.

Deployment Feasibility

Hofstrand and Holz-Clause (2009) define a feasibility study succinctly as an analysis of the viability of an idea. It helps the designer to accurately assess the probability of the success of the new system. The feasibility study was done during the system analysis that preceded the design and development of *E-Maths*, and after its development.

Technical and Operational Feasibility: The system analysis revealed that most public secondary schools do have available at least a set of computer systems, though this might be locked up inside the Principal's office. A school that one of the researchers investigated even had a VSAT installed in the school premises. Another school in which the researcher acted as a volunteer mathematics teacher had a set of computers donated to the school by the Parents Teachers Association. Recently, teachers in Oyo State were directed by the government to be computer literate. Thus, the government is encouraging the use of information technology tools by teachers and students. In the same vein, university graduates from the National Youth Service Corps scheme (who are expected to be computer literate) are posted to these public schools. Furthermore, most of the senior secondary school students, particularly in the uppermost class (SS3), possess basic computer literacy and skills for operating sophisticated mobile sets and using computer chat or browse the Internet, register for public examinations online, or access their Facebook or Twitter accounts. Access to computers is also readily available, for instance at cybercafés located at various points in urban areas, near schools, and in some rural communities. Both the online and CD-ROM versions are therefore technically and operationally feasible for secondary school teachers and students to use.

Economic Feasibility: Economic feasibility relates to the financial resources needed, not only to deploy and maintain a new system. The major additional expenses to be considered by a school that wishes to use an e-learning system such as *E-Maths* are: (i) acquiring, installing and maintaining desktop computers for students' use; plus (ii) establishing a school intranet to run the online version; or (iii) acquiring the CD-ROM version for offline use by students within the school or at home. The CD-ROM version clearly has almost negligible cost implications compared to the intranet option, particularly if the school already has some computers for students use.

Hardware, Software and User Training Requirements

In terms of the hardware and software requirements to use *E-Maths*, these were determined carefully, taking into consideration the fact that the students are likely to use it in environments (public secondary schools or homes) where only very basic desktop systems are available and local area networks (LANs) are absent. Thus, the application is designed to run on Microsoft Windows 98 (and preferably Microsoft Windows XP or later versions), with installed flash player and web browser (preferably Mozilla). The following minimum level hardware configuration is recommended: 512Mb RAM; 40Gb HDD; 52X CD-ROM drive; 15" SVGA monitor; Pentium III processor; Multimedia kit.

In respect of user skills and training, at the very least, it is assumed that users of *E-Maths* have basic skills in computer operations. Therefore, the training required is to expose users to the basic operations of the tool. A computer appreciation course can be organised for all teaching and administrative staff. Students may be included, although the system analysis revealed that most of them at the SSS level have adequate computer skills to use the CD-ROM version. However, for the effective use of the online version, the required training content should cover: computer fundamentals; windows fundamentals; applications packages (especially Microsoft PowerPoint and AuthorPoint); and hardware and software management. In addition, for the deployment and administration of the online version of *E-Maths*, some selected teaching and technical support staff might need basic level training in the use of PHP, MySQL, Acquia Drupal packages and the WAMP environment.

Recommendations

Based on the findings obtained in the different aspects of the work, from literature review, through system analysis, design, implementation and evaluation, it is recommended that:

(a) Computer skills should be taught in all public secondary schools.

(b) School authorities, backed by governments and the federal and state levels, and private sector organisations should make available computer systems and backup electricity power supply sources to public schools.

(c) Teachers should be availed the opportunity to acquire computing and participatory e-learning development skills through short holiday courses.

(d) Teacher training institutions should include the development and use of e-learning tools in their curricula.

(e) In view of the ICT infrastructural constraints that most Nigerian secondary schools face, hybrid forms of e-learning that combine face-to-face classroom instruction delivery and e-Learning using CD-ROMs as a delivery platform is the most practicable option available for some time, although an intranet-based learning management system could also be deployed in some schools.

Conclusion

Among other things, this research has shown that the e-learning tool development process is not rocket science, neither is it the exclusive domain of computer scientists or programmers. A knowledgeable and experienced classroom teacher armed with knowledge of computer operations could use available content management tools to do it. Due to the limitations of time, this research limited itself to only a subset of mensuration topics in the existing WAEC mathematics syllabus. Further research could focus on: comprehensive testing and use evaluation across many schools of the initial and improved versions of *E-Maths*; experimental testing of the application to assess impact on students' achievement in mathematics; coverage of more topics from the mathematics syllabus; coverage of other subjects in the secondary school curriculum; a collaborative effort among schools to develop other e-learning tools, approaches and courseware for use in the various Nigerian public and private secondary schools.

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Tolulope O. Awodeyi is part time lecturer at the Department of Networking and Systems Security, Highland College of Technology, Ibadan, Nigeria. He obtained his B. Sc. in Computer Science from the University of Ibadan in 2006 and Master of Information Science from the Africa Regional Centre for Information Science (ARCIS), University of Ibadan, Nigeria in 2011. His core research interests are in the area of eLearning, mLearning and Human Computer Interaction.

Mutawakilu Adisa Tiamiyu is Professor of Information Science at the Africa Regional Centre for Information Science (ARCIS), University of Ibadan, Nigeria, and has been Editor-in-Chief of this journal since 2008. He obtained his bachelor's and master's degrees in economics from the University of Ibadan between 1976 and 1984, and MLIS and a doctoral degree in information science at the University of Western Ontario in 1985 and 1990, respectively. His research interests include management information systems, e-government, knowledge organization and database management.

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Mapping Mixed Methods Research in Library and Information Science Journals in Sub-Saharan Africa, 2004 – 2008

Patrick Ngulube
Department of Information Science,
University of South Africa
Pretoria, South Africa
ngulup@unisa.ac.za

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Abstract

This article explores the use of mixed methods research (MMR) in articles published in library and information science (LIS) journals in Sub-Saharan Africa (SSA) from 2004 to 2008. Mixed methods research entails using multiple observers, theories, methods, and data sources in a single study, thereby enabling the different methods to beneficially corroborate or validate one another. The MMR framework provided in the methodological literature was used to determine how this method was practised within the LIS scientific community in SSA. Six hundred and eighty five articles published in nine peer-reviewed LIS journals in SAA were analysed. The study found out that most of the articles used only survey designs or historical research methods. Only 48 out of the 685 articles (seven per cent) used MMR approaches, which is clearly limited and inadequate. The study recommends a paradigm shift and a change in the mindset of LIS researchers in SSA in order to be able to exploit the advantages offered by MMR.

Keywords

Research methodology, Mixed Methods Design, Library and Information Science, Research paradigm

Introduction

The library and information science (LIS) discipline is fast becoming popular in Sub-Saharan Africa (SSA). This is evidenced by the number of universities offering courses in LIS, the various existing associations in that field in many countries, and the plethora of published LIS journals, monographs, chapters in books, patents, reports, and conference papers and proceedings through which LIS researchers in SSA have contributed to the global LIS literature.

Research and scholarly communications are fundamental to the scientific growth of a field. The evolution of a discipline partly hinges on the development of the field's theory and the field's research methods. The latter is the focus of this article. Confidence in the conclusions drawn from research within a field can only be strong if sound methodological practices underline the research (Ketchen, Boyd and Bergh, 2008). Whether or not a fuller picture of the phenomenon being researched can be portrayed depends on the methodology that is used in the inquiry.

Until recently, researchers have been dogmatically using either the qualitative or quantitative methods to understand social phenomenon in a mono-method mode. The dichotomy in the perspectives is understandable if we accept that a paradigm refers to an "accepted model or pattern" (Kuhn, 1962:23). Paradigms are human constructions that tend to be prescriptive and exclusive. They have a tendency to constrain intellectual curiosity and innovation as templates do. These research perspectives or 'templates' can be further categorised as constructivist and post-positivist respectively.

The differences in the knowledge claims of the constructivists and post-positivists led to what has been described as paradigm "wars" or the incompatibility and purist debate. Energies were spent on fostering the qualitative and quantitative divide. The argument was that the two worldviews were based on different ontological (nature of reality), epistemological (nature of knowledge), axiological (values in inquiry) and methodological (process of research) assumptions which rendered the two paradigms incompatible. For instance, one of the arguments to support this stance was that the belief in a round world precludes belief in a flat one. The adversaries in the paradigm "wars" needed to be reminded that there is no bullet-proof design. Consequently, the approach to research epistemologies should be flexible and pragmatic. All research methods have strengths and weaknesses. Indeed, the pragmatists provided that reminder, and they turned out to be the peacemakers in the paradigm "wars" (Creswell and Plano Clark, 2007).

In the long run, researchers began to realise that qualitative and quantitative methods were not diametrically opposed and divergent to each other as they imagined; instead, they complemented and strengthened each other giving the possibility of obtaining a comprehensive picture of social phenomenon. It became futile to fight over the incommensurability between constructivism and objectivism because it became clear that, "the (constructivist account) may deny the reality of the very phenomena that the objectivist account seeks to understand" (Bryman, 2007:16).

Nowadays, there is a strongly held view that bringing together both quantitative research and qualitative research so that the strengths of both approaches are combined leads to a better understanding of research problems than either approach alone (Creswell and Garrett, 2008). However, there is no significant discourse around the use of mixed method research (MMR) in the LIS research discourse in SSA.

Trends, pressing issues and challenges in a discipline may be identified through an analysis of the discipline's journals overtime. In fact, one of the most meaningful ways to examine the state of affairs of journals and understand the development of a research area is an analysis of articles (Williams and Buboltz, 1999). Creswell and Garrett (2008) have also suggested that journals are one of the indicators that may be used in measuring the extent of the growth of MMR in a discipline. Furthermore, the trend to examine the prevalence rates of methodological approaches within the social sciences is a new area of research that has "emerged in mixed methods (MM) over the past 5 years" (Alise and Teddlie, 2010:103).

Content analysis of LIS journals published in Africa is not a new phenomenon. Previous analyses examined various trends over time. The choice of the journals and the period analysed seem to have depended largely on the availability of a dependable database. Ocholla and Ocholla (2007) analysed 157 LIS journals published between 1993 and 2006 to measure the research output generated by scholars in South Africa and demonstrated that the use of *Library and Information Science Abstracts* and Web of Science in conducting citation analysis of LIS research output emanating from Africa is counterproductive as most LIS journals are not indexed in these databases. For instance, the only LIS journal published in SSA indexed in the Web of Science is the *African Journal of Library, Archives and Information Science (AJLAIS)*, having only been included in 2007.

Manda (2002) reviewed the state of research methodology in African librarianship through a content analysis of journal articles published in AJLAIS between 1991 and 1999 and concluded that quality of research methodology and consequently the entire research process in African librarianship require major improvements. Similarly, Ngulube, Mokwatlo and Ndwandwe (2009) evaluated articles that were published in six South African journals during the period 2002 and 2008 to determine the research strategies they used and identified the lack of methodological pluralism in conducting LIS research in South Africa as being problematic.

The purpose of this study is similar to Manda's (2002) in terms of its focus on the relative uses of different research methodologies in published LIS articles, but differed from it in two other respects. Firstly, this study investigated the use of different research methodologies in a wider sample of LIS journal articles in SSA. Secondly, this study focused specifically on the use of MMR in the articles. Specifically, the purpose of this study was to: perform a comprehensive analysis of all articles published in leading LIS journals published in SSA between 2004 and 2008; examine the research methodology used in the articles in order to identify the frequently used methods; and investigate the characteristic of the articles that used MMR, the purposes of mixing and the degree of integration achieved.

Following Hider and Pymm (2008), Järvelin and Vakkari (1990) and Ngulube, Mokwatlo and Ndwandwe (2009), this study used refereed journal articles instead of monographs and other vehicles of scholarly communication to analyse research trends in SSA. It is conceded that peer-reviewed journals constitute the main method of promoting scholarly communication. However, published journals in many disciplines constitute an important vehicle to disseminate ideas, knowledge, and content deemed necessary for the promotion of insights important to a given profession. Put differently, the published refereed journals of a discipline publish a significant portion of its scientific knowledge.

Mixed Methods Research (MMR)

Nature and Antecedents of MMR

The use of mixed methods research is growing in popularity in many disciplines, but there has been limited collective understanding of what constitutes MMR from the time it was popularised until recently (Creswell and Plano Clark, 2007). The variance in definitions is partly accounted for by the diversity of views and backgrounds of the scholars engaged in MMR. Table 1 summarises some of the definitions that were arbitrarily selected from the literature to illustrate the point.

Even if the definitions in table 1 explain MMR in varying degrees, the emphasis is on the use of multiple research methods and philosophical assumptions when conducting research. The views of the scholars are converging on the fact that MMR involves collecting, analysing, integrating and interpreting qualitative and quantitative data concurrently or sequentially in a single study or in a series of studies investigating the same problem irrespective of whichever research methodology is dominant in order to exploit the benefits of combining them and enhancing the validity of the findings.

Table 1: Selected definitions of mixed methods research (MMR)

Definition of mixed methods research	*Author(s)*
"The term 'mixed methods' has developed currency as an umbrella term applying to almost any situation where more than one methodological approach is used in combination with another, usually, but not essentially, involving a combination at least some elements drawn from each of qualitative and quantitative approaches to research."	Bazeley (2008:133)
MMR is defined as "a combination of at least one qualitative and one quantitative component in a single research design, aiming to include the benefits of each method by combining them."	Bban (2008:339)
A MMR study "involves the collection or analysis of both quantitative and/or qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of the data at one or more stages in the process of research."	Creswell, Fetters and Ivankova (2004:7)
Mixed methods designs are "those that include at least one quantitative method (designed to collect numbers) and one qualitative method (designed to collect words)."	Greene, Caracelli and Graham (1989:256)
"The combination of both quantitative and qualitative methodologies within the same study in order to address a single research question."	Hewson (2006:179)

MMR "is the type of research in which the researcher or team of researchers combine elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative view points, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration."	Johnson, Onwuegbuzie and Turner (2007:123)
"Mixed methods designs are those that integrate quantitative and qualitative approaches in a single study or a multi-phased study, comprising the following five specific designs: sequential studies, parallel/simultaneous studies, equivalent status designs, dominant-less dominant designs, and designs with multilevel use of approaches wherein researchers utilize different techniques at different levels of data aggregation."	Leech and Onwuegbuzie (2009:273)
"Mixed methods research combines theoretical and/or technical aspects of quantitative and qualitative research within a particular study."	Rocco *et al.*, (2003:19)
MMR is an inquiry "in which the investigator collects and analyses data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or programme of inquiry."	Tashakkori & Creswell (2007:4)

There are competing claims for the origins and the use of MMR. More than 50 years ago, Campbell and Fiske (1959) advocated the use of multiple methods in measuring a psychological trait. Denzin (1978; 1989) developed the idea further and came up with the concept of triangulation. According to Denzin (1989:307):

> By combining multiple observers, theories, methods, and data sources, [researchers] can hope to overcome the intrinsic bias that comes from single-methods, single –observer, and single-theory studies.

In that sense, combining methods in a single study is not new. The argument is that some scholars have been using closed question items (quantitative) and open-ended items (qualitative) in one questionnaire for a single or series of studies, and that constituted MMR. Ethnographers also lay a claim to having been employing MMR as they were used to collecting both qualitative (e.g. through interviews) and quantitative data (e.g. surveys) when conducting research. These claims were based on the classical triangulation model or meta-analysis tradition of juxtaposing qualitative and quantitative approaches when conducting research and synthesising the results at a later stage. However, they did not conceptualise "mixed methods as a distinct approach of inquiry" (Creswell and Garrett, 2008).

Although previous attempts at employing multiple methods when conducting research were not called or labelled MMR, they form the basis of MMR. In triangulation, the 'mixing' is at a methodological or application level (i.e. collecting, analysing and interpreting data) and seeks convergence, whereas MMR moves beyond techniques and methods as it encompasses all the phase of the research process including the philosophical assumptions and the research question (Teddlie and Tashakkori, 2009), and is open for divergence (for an elaborate discussion, see Hammersley, 2008). The new dynamics of 'mixing' or combining research methods has changed resulting in a third distinct and recognized research paradigm that may be labelled MMR (see Creswell and Garrett, 2008). As the mythological phoenix, MMR research has become the third methodological movement along qualitative and quantitative research (Cameron, 2009).

It is apparent that the purpose of 'mixing' in MMR is multifaceted while the major purpose of triangulation, in the classical sense, is to check for inconsistency rather than to achieve the same result using different data sources (Patton, 2002). For instance, in triangulation, interviews may be used to confirm results obtained through the use of another method, whereas in MMR, in-depth interviews are designed to explore in more detail the findings from a survey, for example.

Types of Mixed Method Designs

A variety of mixed methods research designs have been developed. Although there are many types of MMR design, their mere existence provides researchers with a framework to design and to implement studies, and a lexicon to utilise when interpreting and disseminating research findings (Teddlie and Tashakkori, 2009). However, there is a high degree of overlap among the types of mixed methods designs. According to Cameron (2009), the most popular typologies of mixed method designs are the following:

i. Caracelli and Greene (1997) typology included three component designs (triangulation, complementary and expansion) and four integrated designs (iterative, embedded/nested, holistic and transformative);

ii. Teddlie and Tashakkori (2003) six types of multi-strand - mixed method and mixed model study with procedures that are concurrent, sequential and conversion; and

iii. Creswell and Plano Clark (2007) four types of designs (triangulation, embedded, explanatory and exploratory).

All the mixed method research design typologies suggested in the literature are useful in evaluating the rationale behind MMR studies, but we prefer the framework suggested by Greene, Caracelli and Graham (1989) as partially recommended by Onwuegbuzie and Leech (2006) and Leech and Onwuegbuzie (2009), and successfully used by Ngulube, Mokwatlo and Ndwandwe (2009). The five purposes of using MMR suggested by Greene, Caracelli and Graham (1989) after reviewing 57 mixed methods studies are triangulation, complementarity, development, initiation and expansion.

- Triangulation seeks convergence and corroboration of findings through the use of more than one method of gathering and analyzing data about the same phenomenon in order to eliminate the inherent biases associated with using only one method (Johnson, Onwuegbuzie and Turner, 2007; Onwuegbuzie and Leech, 2006).
- Complementarity aims at amplification, illumination and enhancement of the results from one research approach with the results from another methodology using different phenomena (Johnson, Onwuegbuzie and Turner, 2007).
- Development employs results from one research methods to inform the other. For instance, focus group interviews may be used to develop instrumentation to investigate the same phenomenon.
- Initiation seeks contradictions and new perspectives in order to find out why such inconsistencies and paradoxes exist.
- Expansion intends to extend the breadth and scope of an investigation employing different methods for the different components of the investigation.

Research Problem and Questions

Confidence in the knowledge claims and conclusions drawn from research within a field largely depends on the soundness of the research methods used by the practitioners of the discipline. There is mounting evidence that, "A field is strengthened when its researchers show an awareness of the weaknesses and strengths" of qualitative and quantitative approaches (Rocco *et al*., 2003: 23). The use of mixed methods research acknowledges that both qualitative and quantitative methods offer a one-sided glimpse of the social world, and suffer from certain shortcomings that may be overcome by combining the advantages of both methods in answering a research question. Thus, the use of multiple methods increases the overall confidence in the findings of a study. Yet, studies investigating research methods used by LIS practitioners who contribute to journals published in SSA are very limited.

The assessment of the research trends and methods used in journals may provide evidence on the use of MMR research, and data to guide changes in editorial policy and practice intended to attract articles based on balanced and appropriately integrated rigorous research. MMR with its emphasis on the use of multiple methods to effectively address all the facets of a research problem offers an opportunity to LIS research in SSA to depict the complexities and "messiness" of social phenomenon with empirical rigour and credibility.

There is also a desire that this study might stimulate debate around MMR, and serve as model for similar journal assessments in the field of information science in SSA. Five primary research questions guided the study:

- What are the trends in the use of research methods in the LIS journals in SAA?
- How widespread is the use of MMR in LIS research in SAA?
- What was the purpose of using mixed methods research?
- What kind of mixed methods designs did they use?
- What is the degree of integration of qualitative and quantitative components?

Methodology

A sample of nine journals from a possible sixteen in the relevant population was identified (see table 2). The seven journals that were excluded had 140 articles available online between them. LIS journals were selected on the basis of being peer-reviewed and indexed or abstracted in *AJOL* and *Ulrich's Directory of International Periodicals (UDIR)*. These indices were used in order to get a relatively comprehensive picture of LIS journal publication in SSA. Although AJOL indexes 385 peer-reviewed journals from 29 different African countries, there are still some gaps in its database, as some journals are not yet indexed (Proud, 2010). For instance, only eleven journals were indexed in *African Journals Online* under the subject category of "Information, Communication and Library Sciences". That partly explains why the *UDIR* database was also used. Indeed, it uncovered other titles that were not included in *AJOL*. To be selected for the final analysis, the journals were supposed to be accessible online and should have been continuously published in the English language for more than four years during the period under review. The same criteria were partially used by (Ngulube, Mokwatlo and Ndwandwe, 2009).

Onyancha's (2009) study is also valuable in this regard. He assessed the performance of thirteen LIS journals published between 1991 and 2007 in SSA using Google Scholar and concluded that the five core LIS journals in the region were *AJLAIS, Indilinga: African Journal of Indigenous Knowledge Systems, Mousaion: South African Journal for Information Studies, South African Journal of Information Management (SAJIM)* and *South African Journal of Libraries and Information Science (SAJLIS)*. Although Onyancha's (2009) study is useful in showing publication trends in the LIS field in SSA, it may be argued that *Indilinga: African Journal of Indigenous Knowledge Systems* cannot be really considered as a core LIS journal of the region because the bulk of its articles primarily reflect a developmental discourse rather than a LIS discourse. However, it has inter-disciplinary linkages via indigenous knowledge systems with LIS. It was in that light and its categorisation as a LIS journal in *African Journals Online (AJOL)* that it was included in this study. Consequently, the results pertaining to the journal should be understood in this context.

Table 2: Sample frame for journals selected for the study

Name of Journal	*Availability online*	*Country publication*
African Journal of Library, Archives and Information Science (AJLAIS)	2000-2010	Nigeria
ESARBICA Journal: Journal of the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA)	2001-2008	South Africa
Ghana Library Journal (GLJ) (2004-2005 not available online)	2002-2008	Ghana
Indilinga African Journal of Indigenous Knowledge Systems (INDILINGA)	2001-2008	South Africa
Information Manager (IM)	*2006-2007*	Nigeria
Information Technologist (IT)	*2004-2009*	*Nigeria*
Innovation: Journal of Appropriate Librarianship and Information Work in Southern Africa (INNOVATION)	2000-2008	South Africa
Journal of Librarianship and Information Science in Africa (JLISA)	2001	Nigeria
Lagos Journal of Library and Information Science (LJLIS)	2003-2005	Nigeria
Mousaion: South African Journal for Information Studies	2000-2008	South Africa
Nigerian Libraries (NL)	2000-2002	Nigeria
SA Archives Journal	2001-2003	South Africa
Samaru Journal of Information Studies	2006-2008	Nigeria
South African Journal of Information Management	2000-2009	South Africa
South African Journal of Libraries and Information Science	2002-2009	South Africa
University of Dar es Salaam Library Journal (UDSLJ)	2001-2008	Tanzania

The initial aim of the study was to analyse journals published between 2000 and 2010 in order to establish trends over a decade. But this decision was rescinded as the sample of the journals to be studied was going to be significantly small and biased towards journals published in South Africa. The journals that were available online for the period 2000-2010 are listed in table 2. There are evident gaps in the data and that was going to create difficulties in effectively comparing the results across different journals. A deliberate decision was made to cover the period 2004 to 2008 as more journals were published continuously then, and this was going to include more journals from Nigeria and Tanzania, thus making the sample relatively representative of SSA.

The choice of the cut-off date for analysis was determined by the fact that some journals published in 2009 had not yet been fully indexed at the time of the study. The scope of the journals published articles pertaining to the practice and research in librarianship written by librarians, archivists, documentalists, information scientists and other information related professionals mostly from SSA. This information was mainly gleaned from the affiliations of the authors. The authors mainly came from countries such as Botswana, Ethiopia, Ghana, Kenya, Malawi, Namibia, Nigeria, Lesotho, South Africa, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe. The study by Ocholla and Ocholla (2007) confirmed that LIS research output in Africa was published by researchers from some of these countries.

These countries also have institutions of higher learning offering some kind of LIS education in one form or another. There seems to be a positive relationship between affiliation of the authors of the articles and countries with LIS programmes. It seems the probability of an academic working in an LIS environment publishing their research in an academic journal is higher than other practising information professionals whose core business is not contributing to the development of knowledge through scholarly communication and research. That is partly confirmed by Sitienei and Ocholla (2010) who established that many academic librarians did not publish.

The analysis of the articles was at three levels. First, the research strategies employed in the journal articles were identified manually. Secondly, articles that utilised MMR were selected for further analysis. Lastly, based on the typology of evaluating MMR studies proposed by Creswell and Plano Clark (2007), the articles were scrutinised to:

- decide whether rigorous mixed methods were used;
- identify the mixed research purpose statement, research question, type of mixed method design and data analysis; and
- establish whether the authors of studies present information regarding challenges that may have arisen during the study (for example, unequal sample sizes, how participants were selected, and the steps taken throughout the study).

The research articles were first classified into categories using the typology suggested by Hider and Pymm (2008) and Järvelin and Vakkari (1990). In the final analysis the categories used were strategy (for example, historical research and survey), data collection technique (for example, questionnaires and interviews), and types of analysis (for instance, qualitative, quantitative and/or mixed). Categorising articles using this taxonomy proved to be an arduous assignment because most authors using qualitative approaches neither clearly stipulated a theoretical paradigm that influenced the research nor fully described their research design. That detail becomes important when one considers that the qualitative methods may be closely related to positivist epistemology and realist ontology. For instance, as quantitative methods they may employ questionnaires, interviews and observation for data collection. We will develop this point later during the presentation of the discussion.

A total of 685 published articles, excluding editorials, reactions, tributes and non-research contributions categorised as general and short communications were analysed (see table 3). They were excluded in order to provide a sample that was representative of the research commonly presented in the journals.

Table 3: Summary of selected the articles and approaches employed

Approach	*AJLAIS*	*ESARBICA*	*Indilinga*	*Innovation*	*IT*	*Mousaion*	*SAJIM*	*SAJLIS*	*UDSLJ*	*Total*
Mixed	6	-	4	2	5	1	10	4	16	48
Qualitative	35	38	80	68	42	47	3	19	33	365
Quantitative	26	9	24	7	54	20	72	48	12	272
All Paradigms	**67**	**47**	**108**	**77**	**101**	**68**	**85**	**71**	**61**	**685**

The number of articles used in the study was considered to be adequate when compared to studies by Järvelin and Vakkari (1990) that analysed 449 articles, Hider and Pymm (2008) that examined 567 articles, Ngulube, Mokwatlo and Ndwandwe (2009) that evaluated 613 articles published between 2002 and 2008, and Rocco *et al*. (2003) that assessed 16 articles published in 1999 through 2001.

These examples are a pointer to the fact that the time span selected for analysis and the number of articles that are evaluated largely depend on the purpose of the analysis, circumstances of the author (for instance, the availability of a reliable database), and the sample that is likely to establish the trends that are of interest to the researcher. In most cases the periods that are studied are chosen arbitrarily as confirmed by Nwagwu (2007).

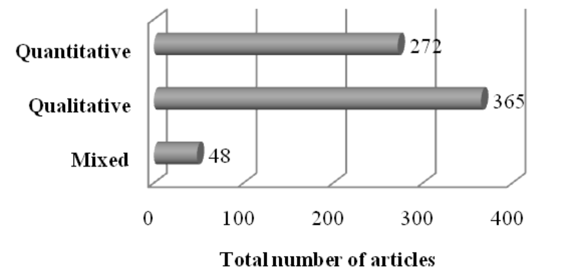
Results and Discussion

The results and discussions are presented below. They are hooked on the research questions that guided the study.

Use of Different Research Methods

The studies that were investigated fall on a continuum from mono-method to mixed methods. Figure 1 depicts the results. There was a considerable amount of difficult, when it came to articles that employed qualitative methods as it was difficult to fit the studies in the framework that was used to categorise the studies because the authors did not describe their research methodology. In fact, many methods sections and abstracts did not explicitly describe the research methodology. Understanding and categorising the various research methods can be a daunting task if they are no explicit explanations of the research methodology. A lack of detail on how studies are conducted by the researchers is not confined to SSA. Hernon and Schwartz (1994) observed that many LIS researchers have tended to focus on the findings and implications of their studies without giving details of the methods used in their studies. As Alise and Teddlie (2010) pointed out, researchers should consider making their paradigm preferences more explicit to facilitate proper classification of their work.

Figure 1: Research paradigms used in the articles



Overall, the qualitative approach dominated the research outputs during the period under review. The same cannot be said of articles published in *SAJIM* and *SAJLIS* where quantitative methods were more dominant than the qualitative ones. MMR research was not prevalent when compared to other research methods. The *ESARBICA* journal did not publish any MMR article. As in a study by Ngulube, Mokwatlo and Ndwandwe (2009), historical research seemed to be prevalent followed by the survey research design. The data collection tools included questionnaires, interviews (i.e. face-to-face and focus groups), observations and secondary data. Steps that were taken in order to increase instrument fidelity were only discussed by 12 (0.02%) researchers. It is essential for researchers to discuss the validity of their instrumentation as that enhances the confidence assigned to the findings.

Use of MMR

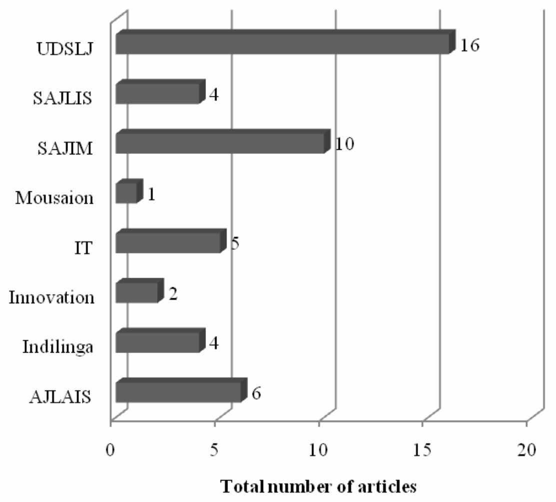
The current study determined that 7% of the research outputs evidenced the use of MMR. Previous studies conducted elsewhere in education, library sciences and business indicated prevalence rates for MMR to be between 5% and 29% "with an approximate average of around 14% to 15%" (Alise and Teddlie, 2010: 120). SSA is evidently below that international average. The prevalence of MMR research in journals published in SSA is depicted in Figure 2. *UDSLJ* accounted for 33.3% of the articles that used MMR, followed by *SAJIM* with 21%.

The researchers did not discuss any challenges they might have encountered using mixed methods research. Some of the challenges that are likely to be encountered by MMR researchers are unequal sample sizes, selection of participants and steps for conducting the whole research (Creswell and Plano Clark, 2007). There is need for scholars who use MMR to describe their methodological challenges and techniques so that other researchers may replicate their studies. This issue is of particular importance since MMR is still evolving. Such explanations will provide examplars of MMR to the novice researcher and reader.

The qualitative and quantitative elements were not weighted equally. The quantitative element was always dominant. Studies that balanced the two elements, or had their dominance in the reverse order, were not evident. Mixing was sequential during data collection or analysis. It was always done from a quantitative angle to the qualitative one. No study reported the use of qualitative tools such as focus group discussions to construct the research instruments for their study, although that evidently happened in some of the studies at their preliminary stages when identifying constructs to measure.

Although, the frequently cited way of mixing in MMR is that it may occur at any point within a research project, from the purpose statement and statement of the research problem, to the data collection and analysis, to drawing inferences from the interpretation of the findings, most of the mixing in the articles that were evaluated happened during data collection or analysis.

Figure 2: Articles in journal employing MMR



Rationale for Using MMR

Authors who used multiple methods or blended research did not refer to it as MMR. Generally, reference was made to the use of combined qualitative and quantitative approaches. The main reason for using multiple methods was for the purpose of triangulation. Unlike, authors of articles in *UDSLJ* who explained why they used multiple research methods, other authors seem to have chosen mixed methods research because it was fashionable rather than for its capability to answer certain kinds of research questions as suggested by Bryman (2005).

Based on the five purposes identified by Greene, Caracelli and Graham (1989), the authors used mixed methods according to the triangulation purpose. The use of both qualitative and quantitative methods to gather and analyse data about the same phenomenon assisted in eliminating the inherent biases associated with using only one method. The major purpose of using MMR seems to have been aimed at the enrichment of the researcher's interpretation of data. The other three reasons for mixing approaches suggested by Collins, Onwuegbuzie and Sutton (2006), which include participant enrichment (for example, increasing the number of participants), instrument validity and reliability (for instance, pretesting and piloting the study), and treatment integrity (that is, assessing the reliability of interventions and programmes) were not evident in the articles that were analysed.

Variety of Mixed Methods Designs

While mixed methods designs may be parallel, sequential, conversion, multilevel and fully integrated as suggested by Teddlie and Tashakkori (2009), all used a sequential mixed methods design in the context of triangulation. The sequential or two-phase design provides the flexibility to adapt the second stage to the findings from the first research stage (Feilzer, 2010), but the studies did not highlight this fact. The studies seemed to be content to use multiple methods in the traditional way of triangulation where the concern was not to get a deeper understanding of the social phenomenon, but rather to detect inconsistencies in the findings. The bias was towards triangulating methods rather than mixing them. The other mixed methods designs such as expansion, initiation, development and complementarity (see Greene, Caracelli and Graham, 1989) were conspicuous.

Degree of Integration of Methods

According to Teddlie and Tashakkori (2009), there is a need to investigate the degree of integration of qualitative and quantitative components in MMR studies. While proponents of MMR agree that an MMR project includes a mixture of both quantitative and qualitative components, they disagree on how these components should be linked and integrated during the research process. Little is known about how exactly one may combine qualitative and quantitative methods in one project.

Studies elsewhere have shown that quantitative and qualitative data and findings are not considerably integrated in most research studies (Greene, Caracelli and Graham, 1989; Woolley, 2009). In fact, many MMR researchers are struggling with true integration of the methods (Feilzer, 2010). Many reasons why the integration is not achieved have been given. They range from a lack of good examples that "genuinely integrate" qualitative and quantitative components in one research (Bryman, 2007; Yin, 2006) to limited information written about the research processes and techniques by which integration can be achieved (Woolley, 2009). In proposing a framework that may be employed in the process of integration in mixed methods studies, Yin (2006:42) emphasised that "the more that a single study integrates mixed methods across five procedures, the more that mixed methods research, as opposed to multiple studies, is taking place". The research procedures in question in this case include: research questions, units of analysis, sample for the study, instrumentation and data collection methods and analytic strategies.

It was difficult to gauge whether or not the instruments had both qualitative and quantitative elements because the majority of the articles did not append a data collection instrument or explain the characteristics of the instrumentation employed. Using the framework provided by Yin (2006), it is evident that MMR was used during data collection and analysis as illustrated in table 4. Only 8 (0.17%) of the 48 MMR articles that were analysed used mixed methods during data collection and analysis stages.

Table 4: Data collection and analysis procedures at which MMR was utilised

Procedure	*AJLAIS*	*Indiling a*	*Innovation*	*IT*	*Mousaion*	*SAJIM*	*SAJLIS*	*UDSLJ*	*Total*
Collection	5	3	2	4	1	8	2	15	40
Collection and analysis	1	1	-	1	-	2	2	1	8
All procedures	**6**	**4**	**2**	**5**	**1**	**10**	**4**	**16**	**48**

A large proportion of the articles that were analysed mixed the methods in a limited way. Thus, most of them were quasi-mixed as characterised by Alise and Teddlie (2010). Most authors (40 out of 48) presented parallel results rather than attempting to integrate them. In other words, findings from different data collection methods were reported alongside each other and the findings discussed separately. Although, the researchers used both qualitative and quantitative methods, the presentation of results reflected the quantitative/qualitative divide as they were "totally or largely independent of each other" (Bryman, 2007:8).

Recommendations and Conclusion

The findings show that the use of mixed methods research by LIS scholars in SAA was not fashionable. The question is: What needs to be done to enhance the use of MMR in SSA? There should be a change of focus on the research methods used by researchers in SSA. That will need skill and the change of the mindset. Scholars in SSA should be aware that MMR is uniquely suited to investigate complex information science issues.

The results show that the incidence of the qualitative approaches is not so much at variance with the use of quantitative ones (see Figure 1). It is very rare to get researchers who are really good in both qualitative and quantitative approaches. In that regard, there is a strong case for researchers with a qualitative orientation to team up with quantitative specialists to research the same phenomenon in order to enhance the richness of data obtained. Forming research teams from both schools of thought may add breadth and depth of understanding the research process. Forming collaborative research teams is one of the possible ways of promoting MRR research in SSA. However, teams have to carefully negotiate and navigate disciplinary or theoretical differences and individuals' status, power, money and interests.

This study has several limitations that merit discussion. A lack of agreed "operational definitions for the codes associated with methodological indicators" was an obvious handicap (Alise and Teddlie, 2010). Secondly, content analysis is a partial and crude indicator of the prevalence of MMR in LIS research in SAA. The current research could have benefited from a mixed methods research approach. Interviews of purposively selected participants might have provided insights that might have been obscured by our research design. Furthermore, the author could have surveyed the members of the editorial boards of the various journals on method of data collection as employed by Short *et al*. (2010). That might have revealed a deeper understanding of why MMR was not popular.

For instance, some researchers may not include a detailed explanation of the use of MMR designs in their research for the reasons outlined by Bryman (2005; 2007). They include:

- Limitations imposed by journals: length requirements may force authors to limit what they can include when reporting their findings and lose information in the process.
- Orientation of journal: some journals are biased towards reporting either qualitative or quantitative findings at the exclusion of mixed methods.
- Tendency to tailor research reporting to the needs of the editors.
- Emphasis on one set of findings "because they have greater faith in one rather than the other, usually because of their methodological predilections".

Such reasons do not become apparent when using the research design in this study. In other words, another approach might have helped to unravel why researchers seem to neglect using MMR designs in their research articles other than the insights gleaned from using content analysis. That fact should be considered when looking at the findings presented here.

Finally, mixed methods research is a new research paradigms although anthropologists and sociologists used multiple research methods since the 1950s. The emphasis then was on measuring social phenomenon using measures that would either end up producing numbers only or anything else except numbers. There was a limited attempt to integrate the quantitative and qualitative measures throughout the whole process. With the rise of MMR as a third research paradigm, the focus is on conducting research that blends the philosophical, epistemological, ontological, axiological and methodological underpinnings of the two paradigms to ensure the integration of qualitative and quantitative procedures throughout the whole research cycle.

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Patrick Ngulube (PhD) is a Professor in the School of Graduate Studies, University of South Africa (UNISA), and has served in various positions in the East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA). His research interests are indigenous knowledge systems, knowledge management, information and communication technologies and sustainable development.

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Towards Public Domain Management of Liberation Movement Heritage Records in Eastern and Southern Africa

Francis Garaba
Lutheran Theological Institute Library, Scottsville, Pietermaritzburg, South Africa
fgaraba@yahoo.com

Abstract

This article reports on research into the management of liberation movement archives in Eastern and Southern Africa. It is based on a systematic review of literature on the subject, content analysis of national archival legislations in relation to the management of liberation movement archives, inspection visits to such archives in the region, and qualitative content analysis of the responses to an open-ended survey questionnaire administered on the heads of national archival institutions of the countries in the region. The study found out that the archival legislation dealing with the management of private archives is outdated, lacks clarity and are punctuated by latent passivity, and that the available regulatory instruments are inadequate to ensure appropriate acquisition for long term public domain management of the liberation movement archives that are currently managed ineffectively by various private archives in the region. The study recommends that such archives, because of their national heritage importance, should be decommissioned from private custody and managed by the various national archival institutions for the benefit of posterity.

Keywords

Liberation movements, National heritage records, Archival legislation, Private archives, East Africa, Southern Africa.

Introduction

The struggle to liberate the continent of Africa from colonialism was a profound and all-time consuming one for Africans during the second half of the twentieth century (Dominy, 2004), and as such this history needs to be documented accurately in whatever appropriate form for the benefit of posterity. Cabral (1972) and Nzongola-Ntalaja (1987) argued that the people's struggle for national liberation and independence from imperialist rule constituted a fundamental component of contemporary history. The struggle for liberation that led to the attainment of national independence and the birth of new nations were results of a protracted struggle by different movements that had one common objective of dismantling settler colonialism. Southall (2003) could not have put it better when he remarked that these struggles took numerous forms, yet they were all characterised by the rejection of racism and imperialism and the demands of previously nationally oppressed peoples for sovereign equity with the colonial powers.

Dominy (2004) observed that "Liberation Struggle" archives are of different types and status, reflecting the diverse nature of the struggle itself. As a result, records were created from within and outside Africa to document this historic epoch from 1950s to 1990s, and these records have to be managed as treasured national assets and made available to the public for research and general interest. Moodley (1993) had earlier opined that the papers and archival documents of the liberation movements in South Africa were among the most valuable original source materials for historical research in the 20th century.

Literature Review

This focus of this study connects two main concepts, about which there does not appear to be consensus in the literature: national liberation movements (or struggles) and records. The definition of national liberation movement has been contentious among scholars. It remains subject to debate, doubt and disagreement, and even elementary questions of definition, terminology and delimitation of the field are still not settled (Valentine, 1987). The conceptualisation of the term is a matter of interpretation, and Wilson (1988) rightly pointed out that defining national liberation movement is a challenging task and argued that the label, as popularly used, is imprecise. For the purpose of the present work, a national liberation movement is defined as a non-governmental organisation which, through violent or non-violent means, strives to win effective national independence in its crusade for emancipation.

There have also been many debates on the definition of a record, and on how records differ from information and knowledge. The word "record" has been a site of contestation as Harris (2000) remarked. This view is shared by Cox (2001) who posited that even records professionals, archivists and records managers engage in protracted debates about what constitutes a record. Definitions with a focus on information, data, structure, origination or end user potential are all offered. Thus, Yusof and Chell (1998) observed that there is no universally accepted definition of the term record, and the varied definitions of the term have led to confusion which affects the formulation of theory to underpin the discipline of archival science. For instance, according to Shepherd and Yeo (2003), a record is any recorded evidence of an activity and is *not defined by its physical format or storage medium*, its age, or the fact that it has been set aside for preservation. Millar (2010), however, defined a record as a piece of information that has been captured *on some fixed medium* – and that has been created and is used to remember events or information or to provide accountability for decisions or actions (emphases inserted to highlight the subtle difference).

Archives are a subset of records, hence the dictum that archives are records but not all records are archives. Millar (2010) observed that archives are those records, created or received by a person, family, an organisation, a business or a government in the course of their life and work, which merit preservation because they provide enduring informational value about the functions, responsibilities, actions or transactions of the creator or about the life and times in which the creator conducted his or her affairs and the society in which he or she lived and worked.

Another important distinction is the one between public records (and archives) and non-public records (and archives). Public records are those created or received in the course of official business by governmental bodies at central, provincial and local levels. Non-public records comprise all other categories of records – private papers, business records, church records and so on (Harris, 2000). This is similar to the view of International Records Management Trust (IRMT, 1999) that non-governmental or private records are those records created, received and maintained by non-governmental organisations, families or individuals relating to their private and public affairs. By these definitions, the records of the former national liberation movements are non-public because the movements were essentially private initiatives, although ultimately having fundamental impact on the socio-political development of the countries where they operated. Such records contain evidence of the activities of the former liberation movements and, by the above definitions of records, include papers, maps, photographs, machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by the movements.

The liberation movement heritage is a nation's cultural capital (Deacon et al., 2003), and so also records associated with it. The essential question then is whether these records are being adequately managed and protected to ensure that this important element of national cultural capital is not lost. To answer this question, it is necessary to look at the regulatory framework in place to ensure that liberation struggle archives are managed professionally. Lacovino (1998) observed that all aspects of record keeping have legal implications. Legislation gives legality to archival operations, and it follows then that policies are offshoots of legislation as they are designed to outline the purpose, objectives and conditions which define the scope of archival activities, the authority under which they operate and the services offered to clients (Schwirtlich 1993:26). Thus, policies establish a framework for the management of records within an archival institution. This view was also echoed by Millar (2010) who argued that considering that archivists, realistically, often have little control over the development of legislation; they should however be fully responsible and active in the development of core policies that define the scope, mandate and duties of their institutions. It is therefore mandatory that all archival institutions establish and maintain a strong policy framework.

Whilst it is acknowledged that the regulatory landscape in which both public and private archival enterprises are operating has its challenges, responsibility as to the management of liberation struggle archives should be a national responsibility and not be left to political parties that spearheaded the struggle considering that the documentary heritage of a country is at stake. Millar (2003) stated that a nation's *Public Records Act or Public Archives Act* must define the record-keeping process and confirm that this process must be supervised by a body separate from those responsible for executing the duties of government. The National Archives is the key agency responsible for the care of records held within a country, it serves as an information auditor, responsible for protecting documentary evidence.

The foregoing view by Millar (2003) is a body statutorily appointed to oversee records keeping. This is not to suggest that private archives be part of the state archival collection as is the trend in socialist countries. Rather, Millar's (2003) view is that there should in every nation be a body that is entrusted by laws to manage some of such records as part of the country's heritage assets. Such an arrangement will not only give legal protection to private archives but will also go a long way in preventing their dispersal and destruction.

Problem Statement

Scholars have been arguing for comprehensive and coordinated information policies to cater for information generated by both public and private institutions in various countries. Mnjama (2005) noted that the private sector is yet to fully participate in the collection and preservation of records and archives of national importance. National archival legislations and institutions in Africa often neglect private archives. Thus, very little is known about the status and management of those private archival records that may be of transient value to their private creators but could be of immense long term value to the countries where and about which they are created. The national liberation movements' records and archives fall into this category, and there is need to investigate how they are being managed in order to initiate policies, legislation or frameworks for their long term management. This need instigated this research.

Objectives

The study focused on collecting, analysing and interpreting information about and from public and private archival institutions and archival legislations in the Eastern and Southern Africa region, which is also the region covered by the activities of the East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA). The main objective of the study was to assess the role of the national archives of the different countries in the region in managing or supporting the management of the records and archives of the former liberation movements, in terms of the existing relationships between national archival institutions and liberation movement archives and the available legislative frameworks for the relationships. The following two research questions were investigated in connection with this objective: How harmonious is the relationship between national archives, political parties and former liberation movements in the management of records of the former liberation movements in the Eastern and Southern Africa region? What needs to be done to improve the management of such records?

Methodology

A questionnaire, an interview schedule and an observation checklist were employed as data collection instruments. The questionnaire was directed to the first population, comprising the heads of the twelve national archives repositories in Angola, Botswana, Kenya, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. The second population comprised the archival repositories housing the records of former national liberation movements within Eastern and

Southern Africa. The focus here was on the seven archival institutions holding ANC (African National Congress) struggle records and archives, as well as the archives of FRELIMO (The Liberation Front of Mozambique), MPLA (The Peoples Movement for the Liberation of Angola), SWAPO (South West African People's Organization), ZANU PF (Zimbabwe African National Union- Patriotic Front) ZIPRA (Zimbabwe People's Revolutionary Army) and PAC(Pan Africanist Congress) . The seven institutions housing the ANC archives are: African National Congress Archives; Alan Paton Centre and Struggle Archives (University of KwaZulu-Natal, Pietermaritzburg); Digital Innovation South Africa (DISA); Gandhi-Luthuli Documentation Centre (University of KwaZulu-Natal, Westville); Liberation Archives, University of Fort Hare; Nelson Mandela Foundation; UWC-Robben Island Mayibuye Archives. However, only nine of the twenty-three provided the requested documents and responses to the questionnaire for the analyses. The third sources of information were the archival legislations of the countries within the region.

The questionnaire contained mostly open-ended items, and the responses to the items, as well as the legislative and other documents were content analysed and interpreted qualitatively. According to Colorado State University (2007) and Ngulube (2003), content analysis involves the collection and organisation of information systematically in a standard format that enables analysts to draw conclusions about the characteristics and meaning of recorded material. The content analysis focuses around certain words or concepts within texts or set of texts. Researchers quantify and analyse the presence, meanings and relationships of such words and concepts and then make inferences about the messages within the texts. The source of the text could be anything written, visual or spoken that serves as a medium for communication and includes interviews, discussions, historical documents, speeches, conversations, films or videotapes (Neuman, 2000).

Traditionally, content analysis is usually divided into two categories, namely: conceptual analysis and relational analysis (Babbie and Mouton 2001:492). Conceptual (thematic) analysis involves establishing the existence and frequency of concepts usually represented by words or phrases in a text. In contrast, relational (semantic) analysis examines the relationships among concepts in a text (Colorado State University 2007). Thus both recurring and related concepts represented by words and phrases in the regulatory instruments of the surveyed institutions were examined in search of meaning.

Findings

The nearest the National Archives Act (1986) of Zimbabwe gets to assisting in the collection of private archives is in Section 2(b) which refers to any record or other material acquired by the Director of National Archives in terms of paragraph (c) of Section 5 of that Act. Therefore the *Director:*

> ... may acquire by purchase, donation, bequest or otherwise any record or other material which in his/her opinion is or is likely to be of enduring or historical value.

A similar situation is witnessed in the Public Archives and Documentation Service Act of Kenya (1991), which provides that, with the powers vested in the Director, s/he may

> ... approve any institution, whether private or otherwise, as a place wherein may be deposited, housed or preserved either permanently or temporarily any public archives, records or records which have been declared historical records, under Section 9.

The National Archives of Namibia Act (1992), the National Archives of South Africa Act (1996) and the National Archives of Tanzania Act (2002) are explicit with regard to the management of private archives in their respective countries. The vision of the National Archives of Namibia as enshrined in its archival legislation is to:

> ... acquire, conserve and provide access to private and public records in all formats and media of national significance ... and co-operate closely ... with the National Library as well as other information centres.

A site visit to the National Archives of Namibia confirmed this co-operation as the institution is leading the digitization project of liberation struggle archives by providing storage services and expert advice to the records of the South West African People's Organization (SWAPO) under the auspices of SWAPO Party Archives (SPARC).

The National Archives of South Africa Act (1996) provides in its preamble a catalogue of terms in which the definition of a non-public record is spelt out for the sake of clarity. The Act goes further to define the objects and functions of National Archives with regard to non-public records as being to:

(a) preserve non-public records with enduring value for use by the public and the State;

(b) make such records accessible and promote their use by the public;

(c) collect non-public records with enduring value of national significance which cannot be more appropriately preserved by another institution ...; and

(d) maintain national registers of non-public records with enduring value and promote co-operation and co-ordination between institutions having custody of such records.

In addition, South Africa has the Promotion of Access to Information Act, No. 2 of 2000, which requires private institutions to present a manual containing the narration of records, which is a laudable move to promote access to information.

The National Archives of Tanzania Act (2002) similarly defines private archives in its interpretation section for clarity's sake, and Section 13 (2e) states that the Director may do all such things as appear to him necessary or expedient for maintaining the utility of the National Archives and any other archival repository under his control, and may in particular *... accept private records for safekeeping and acquire private records by gift, bequest or deposit.*

The Minister is also empowered by Section 26 (1) to acquire private records. Thus, provided:

> ... [they] are of national importance, and that it is in the public interest that they be acquired, he may, after consultation with the owner of the private records and subject to the following provisions of this section, acquire them, or any part of them, and declare them to be public.

However, a visit to the National Archives of Tanzania seemed to confirm otherwise as archives pertaining to the Liberation Committee under the now defunct Organization of African Unity (OAU) were said to be under the custody of Tanzania Defence Forces (TDF). Verification efforts to establish the whereabouts of these records hit a brick wall due to non-co-operation by the National Archives of Tanzania that is purported to have supervisory powers over these records. Not surprisingly, Chachage and Ngulube (2006) were highly critical in their appraisal of the Records and Archives Management Act (United Republic of Tanzania 2002), an Act which pays little attention to business records at a time when the majority of government enterprises were being privatised. In section 26 (1), for instance, the Act indicates an interest in only acquiring private records of national importance and public interest. The pertinent burning question is: How would the National Archives identify private records of national interest if there was no law regarding their management and a clear mandate for National Archives to identify and manage them?

In summary, the analysis of archival legislation reveals in some cases the inherent semantic ambiguity which also suggests that a revisiting of these issues is needed. In other cases however, there appears to be good cooperation between the National Archives and private archival collections, such as those of the liberation movements.

Other important instruments for the location of private archives are guides and directories, including those published by institutions holding the papers. Two of the nine institutions that participated in the survey had published guides and directories to private archives in their countries compared to seven without. Site visits to the institutions confirmed the existence of these guides and directories, as this researcher was shown printed and electronic copies. Hinfelaar and Macola (2004:8) stated that the decision to compile their *First Guide to non-governmental archives in Zambia* originated from a deep concern for the state of the materials in that country. These private archives are under-utilised, inaccessible and often in danger of decay or destruction owing to lack of resources and expert care.

A survey conducted by Seton (1984) observed that in recent years in the developed world there has been an increasing tendency to regard private archives as part of the national archival heritage, and to legislate accordingly. This contrasts markedly with what is happening in the developing countries. According to Chachage and Ngulube (2006), the passing of "FOI laws" (Freedom of Information) in some African countries underscores the need for some private records connected with public sector to be managed so that they will be available when citizens request to have access to them under the terms of the law.

The present research also sought to find out whether there was any competition between different institutions over the acquisition of private archives. Three of the archival institutions (33.3% of those who participated in the survey) noted that relations between private and public archives were not harmonious in as far as the acquisition of private archives was concerned. The three also attested that the general situation in their respective countries with regard to private archives was not satisfactory. In contrast, one other institution reported that it enjoyed a harmonious relationship with other repositories in as far as the acquisition of private archives was concerned.

Areas of concern noted by the archival institutions were on the physical state of private archives, their storage and custody, arrangement and finding aids and access. One of them reported that personal papers and archives of liberation movements were in a state of neglect, while for another institution the neglect was affecting various categories including papers of families and estates, and literary manuscripts.

On whether private archive administration was included in the curriculum for archival training, two of the institutions reported that it was not, compared to one institution which included this component in training courses for archivists.

Finally, in response to the question of how best to improve private archives administration, the respondents mentioned policy reviews, legislation revisiting, co-operation and the overhauling of curricula in the training of archivists.

Discussion

In the surveyed institutions, the content analysis of the existing legislation in the respective countries revealed that in some cases there was lack of precision in provisions for the management of private archives, whereas in others this was clearly spelt out. Millar (2003) submitted that the first critical step in managing records effectively is to ensure the development and maintenance of a strong legislative and regulatory framework for record keeping. Records and archives legislation establishes the infrastructure within which appropriate records and archives systems can be created and implemented. The conclusions that can be drawn are that the legislative apparatus dealing with the management of private archives lacks clarity and a defined programme of action. Merely acknowledging the existence of private archives in the form of registers, without adequately catering for them in terms of their administration, compounds the problem of this lack of clarity and definition.

Another major problem in the management of the former liberation movement records is that portions of the records are held by competing national political parties that emerged from the separate movements in the same country. The competition and sometimes animosity between the major ruling and minor political parties makes it difficult to ensure adequate identification and management of some of the records. The minority parties that emerged from former liberation movements often feel their voices have been sidelined by the major political parties in favour of major political movements, and accuse them undermining their archival records in the presentation of history in general and their roles in the emancipation crusade of their countries. Two examples of this, in Zimbabwe and South Africa, may suffice here. In Zimbabwe, there is fundamental difference in the emphasis of the ruling ZANU (Patriotic Front) concerning its own liberation movement records and roles, and that of the Mafela Trust Archives in Zimbabwe which is concerned with the recording and preserving ZIPRA (Zimbabwe People's Revolutionary Army) history. Thus, the national chairman of the ruling ZANU (PF), John Nkomo had cause to voice out an urgent need to record the true history of the ZIPRA to reflect its role in the liberation struggle (Nkomo, 2006). In South Africa, the conflict is between the ANC and the Pan Africanist Congress (PAC). Sapire (2009) observed that because it was the ANC rather than the PAC that emerged as the premier liberation movement, the role of the latter has been sidelined. In turn, there has been a tendency by historians of liberation movements in South Africa to write from the perspectives of the victors, and this is because the archival record of the ANC is more extensive and coherent. This unilateral and partisan approach to the documentation of the liberation struggle history has led critics to point out that it is important to shift emphasis from a narrow formulation of victors' narratives to more nuanced and inclusive histories of struggle (Isaacman, Lalu and Nygren, 2005). More broadly, in order to be relevant to all citizens, the various archives in a country need to reflect all aspects of that country's past, without excluding one group in favour of another.

In a nutshell, the majority of national archival institutions were not active as far as the management of private records was concerned. The situation obtaining on the ground is that political parties of former national liberation movements have the sole mandate over these records, and they have established their own archives that stand out independently of the national archives. This state of affairs is not satisfactory as it is the thesis of this study that archives need to serve people and not political systems as it is presently the case. Not surprisingly, areas cited as cause for concern in the management of private archives pertained to acquisition, arrangement, storage and custody, finding aids and access. In addition, respondents mentioned the need for policy reviews, legislation revisiting, co-operation and overhauling of curricula in the training of archivists, in as far as the administration of private archives was concerned.

It can thus be concluded that liberation struggle archives are under threat due to varying levels of inadequate care in the different countries. Mazarire (2009) summed up the crisis situation in the management of the records of former liberation movements by pointing to two of Zimbabwe's main liberation movements, Zimbabwe African National Liberation Army (ZANLA) and ZIPRA:

> Very little primary material has come from their private collections and it is public knowledge that both movements still do not possess proper archives. Their age-old animosity continues to make any effort to reveal their individual collections a security concern and this way much of this crucial data has lacked systematic and proper care or been simply left to decay ... there is so much more crucial material in the hands of participants in the war who lack confidence in existing modes of documenting and archiving this liberation heritage. Material such as manuscripts, letters, rare photographs, etc. has been encountered in people's private libraries, locked up in trunks in their basements or worse still, left in the custody of people who have no idea of its value.

This assessment mirrors the general situation with regard to private archives holding the former national liberation movements' records. There is a clear need for urgent action to save such records and archives, which calls for appropriate advocacy and legislation, public domain funding, and appropriate professional training of archivists in the various countries in the proper maintenance of such records and archives.

Conclusion and Recommendation

The main conclusion of this study is that the laws that govern the national archives of the countries within ESARBICA are wholly inadequate when it comes to the management of private records of national importance. In particular, the regulatory instruments dealing with the management of private archives are outdated, lack clarity and are punctuated by latent passivity. Archives sustain us, provide meaning, give us a place in posterity (Cox, 2009), and provide insights into the human condition (Dearstyne, 1993). Jonker (2009) rightly pointed out that modern archival legislation, which still focuses on public records, cannot ignore the growing importance of private records in the fabric of society's archival memory.

Liberation struggle archives are like other historical records, but their deeply emotional value and connection with significant epochs in the heritage of the countries is what makes them unique, irreplaceable and a particularly prized asset. The liberation struggle heritage is a nation's cultural capital (Deacon et al., 2003); hence, the it is necessary to protect them jealously at national, and not organisational level. It follows then that stewardship efforts concerning liberation movement archives should be oriented towards achieving the ultimate goal of ensuring that this treasured national asset is adequately safeguarded in these countries before it is consumed by the tides of time.

The findings and conclusions of the study lead to the following two recommendations: (1) that legislation pertaining to the administration of private archives in these countries should be reviewed or modernized in order for national archival institutions to be empowered to identify, support and manage effectively the various liberation movement records and archives of different origins currently being maintained by different private archives and political parties in the countries; and (2) that national archival institutions need to spearhead this drive for the required new legislation that will empower them to manage valuable private records for their countries.

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Francis Garaba is Manuscript Librarian at the Lutheran Theological Institute Library, Scottsville, South Africa. He holds a Bachelor of Arts Honours degree in history from the University of Zimbabwe, an MIS degree and a doctorate from the University of KwaZulu-Natal, South Africa. He has worked for the National Archives of Zimbabwe as an archivist and at the Midlands State University in Zimbabwe as a lecturer in records and archives management. His research interests include records and archives management in national liberation movements, churches and sports associations.

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Strengthening Public Library Funding in Nigeria through Innovative Activities

Umunna N. Opara
Department of Library and Information Science,
Federal Polytechnic, Nekede,
PMB 1036, Owerri, Imo State, Nigeria
nenii20022003@yahoo.com

Abstract

Past political leaders of Nigeria had envisioned the public library as a foundation of a literate population, an educated citizenry, and a free democratic society and so supported it generously. The support from the succeeding political leaders has now waned and the majority of public libraries in Nigeria are either experiencing declining or static public funding. Policy makers today often acknowledge, and yet pay only lip service, to Nigerian public libraries. This paper explores the various local, national and global opportunities outside of state public funding that are available to be exploited by Nigerian public libraries and public librarians and other stakeholders through vigorous, concerted and sector-wide advocacy, proposal writing and grant seeking activities. The paper emphasises the imperative for public library stakeholders to promote the social and development relevance of public libraries through these initiatives.

Keywords

Public library, Budgeting, Public funding, Non-public income, Innovations, Nigeria

Background

Though there were some forms of public library service in Nigeria before 1955, such as that provided by the Lagos City Library (established in 1932), the history of public libraries in Nigeria actually started in 1955 with the promulgation of the first public library law by the defunct Eastern Nigerian Regional Government. The period spanning from 1955 to 1980 would appear to be the golden era of public libraries in Nigeria. This is because the public libraries in Nigeria within this period enjoyed tremendous support from the political leadership that demonstrated serious commitment to building the literacy and intellectual capacities of their citizens. As Mchombu (1991) and Mambo (1995) have noted, during this period in Africa, the public library received as much priority in government business as other essential services like hospitals and schools. With this level of support, Zeleza (2000) noted that library systems in Anglophone Africa (of which Nigeria is one) experienced rapid development during the period. Thus, the library was given a top priority and librarians endeavoured to build quality library collections by concentrating on acquiring materials at an exponential rate, recruiting and training staff both in local and foreign library schools in order to equip them with the requisite knowledge and skills that would enable them to manage the libraries. Funding came not only from the establishing authorities, but also from bodies such as UNESCO, the British Council, Ranfurly, Carnegie Corporation of New York, etc. This is why between 1955 and 1967, the defunct Eastern Regional Government of Nigeria was able not only to build its headquarters in the regional capital of Enugu, but also five other branches.

Unfortunately, government funding of public libraries in Nigeria has not been salutary since the 1980s. With the balkanization of the three regions and later four of the country into the present 36 states and the Federal Capital Territory, Abuja, there is now a public library presence in each state of the Federation, with some state public library systems having branches in some local government areas. However, while some might be enjoying improved public fund allocations, the majority are either experiencing static or declining allocations. For instance, in his study of public libraries in Edo and Delta States in the South-South Nigeria, Emojorho (2005) reported that the libraries were performing poorly in most aspects due to appalling resources. The bane of public libraries in Nigeria is poor funding, and every other problem confronting them emanates from that (Opara, 2008). Information buying power of these libraries has been declining over the years as a result of static budgets, inflation and exponential growth in the literature of all kinds and of all formats.

Adequate levels of funding are critical to the success of a public library in carrying out its functions. Without suitable levels of funding over the long term, it is impossible to develop policies for service provision and make the most effective use of available resources. A public library that operates with “hand-to-mouth” funding is unlikely to be able to undertake strategic projects to grow its services. Where a public library does not have a purpose-built library, or where there is need for a new library building, money is needed to build and maintain it. Collections of new books and periodicals require money for their replacement and funds are also needed to maintain and update ICT facilities in these digital times. Human resources need to be employed and trained and retrained.

According to Kar et al (1999), over 10 million journal articles are published annually besides new items, editorials and articles that are appearing in popular print media. This figure may have doubled since considering the overwhelming impact of ICT on publishing. The authors further observed that while there is a deluge of information on one hand, the cost of collecting, processing, storing and disseminating information has been escalating. Estimates show that a three to four fold rise in library budget was needed by the year 2000 to maintain the same acquisition levels as in 1990 (Kar et al, 1999). This means that this amount of rise or more in budget will be needed by 2012 to maintain the same level of acquisition as in the year 2000. As Nigeria’s population grows, and literacy and school enrolment levels continue to rise due to successes in the achievement of the Millennium Development Goals, there will be a corresponding increase in the population of potential and actual users of public libraries. The need for significant increases in the funding of public libraries will be heightened by these developments, as well as the digital era challenges such as the need for digital infrastructure, delivery formats, licensing and copyright regulations.

Problem Statement

The heavy and almost exclusive reliance on government funding appears to be at the heart of the funding crisis that Nigerian public libraries face. Although the problem is not peculiar to Nigeria, it is much more severe and constraining. The United States National Centre for Education Statistics (2000) reported that 77% of the incomes of public libraries in that country were acquired from local funds, 13% from states’ funds, 1% from federal funds, while 9% came from non-public sources such as user fees, donation/grants, etc. This shows four levels of funding arrangement involving the municipality, state and Federal Governments and non-public sources. By contrast, Nigerian public libraries depend almost totally on government public funding for their sustenance.

Not only are the funding patterns of public libraries in Nigeria and the USA different, the percentage from non-public sources for public libraries in Nigeria is hardly up to 1%. This is because most public libraries in Nigeria have not started to explore these sources of funding. While public libraries in the USA have policies and programmes on fund-raising from non-public sources, those in Nigeria do not. According to Coffman (2004), total reliance on public funding of public libraries has two significant disadvantages. In the first place, with no alternative source of funds, when the economy is in crisis and there is a cut in the budget or when the budget is static as a result of government’s poor appreciation of the role of the public library (as is the case in Nigeria), there will be no option but to cut hours, cut subscriptions, close branches, owe staff salaries and other entitlements, etc.

Secondly, the public library must compete with other essential and often pressing social service institutions like hospitals, schools, etc, from the limited public fund. Thus, even improved library services and high demand for services are unlikely to earn the public library the sympathy of the funding authorities. Moreover, Nigerian political leaders often prefer to spend available financial resources on projects which have immediate impact on the people or which in their calculation could translate into votes during elections.

Objectives

The poor funding of public libraries in Nigeria requires that public libraries wean themselves from their exclusive reliance on government funding and develop a more diversified income base. The ways to achieve this is through innovations in income generation and budgeting. This need motivated this paper. Accordingly, this paper explores some budgeting innovations and the various local, national and global opportunities outside of state public funding that are available to be exploited by Nigerian public libraries and public librarians through vigorous, concerted and sector-wide advocacy, proposal writing and grant seeking activities. The paper also aims to serve a call to action by public library stakeholders to take control of their own destinies to promote their social and development relevance through these initiatives.

Budgeting Innovations

The development of the public library budget is one of the library director's most critical functions. In Nigeria, public libraries are usually provided with templates by the establishing governments to guide them in preparing their annual estimates. Thus, they are constrained by budget frameworks and limits imposed on them by their establishing authorities, which often do not cater for their peculiarities as the public libraries. Notwithstanding these constraints, innovative and dynamic public library directors will usually find ways to improve the income sources and budgets of their libraries by being adequately knowledgeable, skilled, self-motivated and aggressive to harness the multifarious income generation opportunities that exist in their local, national and global environments.

A fundamental issue that such a library director needs to consider is what would be an adequate library budget in the context of its situation dictated by its goals, the needs of its immediate community, and the level of services it seeks to provide to its existing and potential users. The rest of this paper collates and discusses from the literature some of the useful guides and recommendations on budgeting and alternative income generation opportunities that Nigerian public libraries should explore.

Budget Adequacy

What benchmarks are used to determine if a public library budget estimate is adequate? This question is critical because funding mechanisms for libraries that are not based on objective analysis of current and future needs impair both short and long-term planning (Allen and Dickie, 2007). While standards for academic, special and school libraries may be found helpful in determining funding benchmarks, public library standards do not provide such helpful guide. Public library managers need to know that the most concrete and realistic measure of the adequacy of their library budget is the per capita expenditure by the library. In turn, knowing the adequate budget enables the public library manager to determine the level of existing shortfall and the magnitude of efforts needed to bridge the gap.

Public Funding Adequacy

A public library is equally available to all members of the community regardless of race, nationality, age, gender, religion, language, disability, economic and employment status and educational attainment (Gill et al, 2000). This implies that the public library in preparing its budget estimates will first of all determine the population to be served and thereafter determine the per capita. The resultant figure will be the estimate for the year. This is a formula-based budgeting and according to Allen and Dickie (2007), such budgeting may provide more stability and render the library less vulnerable to disproportionate cuts

Opara (2008) has argued that for higher level of funding to be obtained from public fund allocations, the public library managers would need to make extensive use of lobbying. The requirements for successful lobbying include an understanding of the workings of both the legislative and executive arms of government and the ability of the management and board to state clearly and persuasively how the library will benefit the people to be served. The elements that are most useful in acquiring political support for the library budget are an understanding of political pressure points and the willingness and ability to lean on them (Mason, 1990). Library budgets, according to Lux (2007), have a lot to do with how politicians see libraries. To this end, the use of a multifaceted approach involving lobbying, advocacy and friends of the library group could change the negative attitude and poor rating of public libraries in government priorities.

Furthermore, it may be helpful if the library manager gives the approving authorities additional information which may help the library's case, such as: population of children, adults and the handicapped who use the library; number of users who are turned away daily because of inadequate reading space; institutional affiliations of users to show that the library caters for full-and part-time students of institutions of learning in the state including distance learners; role of the public library as a critical link to the education of the state's citizenry and its role in the reduction of illiteracy which is one of the cardinal Millennium Development Goals (MDGs).

Books and Materials as Consumable Items

In preparing the library's estimate, the library manager is enjoined to include books and other materials as consumable items. It is a well known fact in library practice that stock-building is a continuous addition of new titles of books, new editions of available titles and subsequent issues of periodicals. Treating these items as consumables ensures that fund is allocated on annual basis instead of only occasionally.

Pluralistic Income Generation Opportunities and Innovations

It has become increasingly necessary for public libraries to seek alternative sources of revenue to support activities that were once thought to be the responsibility of the establishing authorities (Burhingame, 1995). In like manner, Kemmis (1998) argues that if libraries are to meet the increasing demands of technologically savvy clientele while maintaining quality collections, they must actively seek alternative funding for high-tech services that are now considered commonplace by the populations they serve. The decline in government funding has made it expedient for public libraries in Nigeria to seek for alternative/additional sources of funding in order to be able to sustain the levels of services which, hitherto, statutory allocation catered for and also improve on those services. In pursuit of alternative funding, Nigerian public libraries must do the following: seek and obtain the support and cooperation of their boards and their supervising ministries; manage the support appropriately so that it does not overshadow the library's cardinal duties; tolerate and manage the risks and uncertainties which go with the pursuit of alternative funding; undertake entrepreneurial and income-generating activities that should however not be in conflict with the library's core services; ensure that they operate within the limits of the legislation establishing them and defining the scope of their library services; seek to change any legislation that is considered to be an impediment to the effectiveness and efficiency of their operations as public libraries in the modern society.

Various opportunities and associated strategies exist for improving and diversifying the level of public library funding in Nigeria, as follows:

Contractual Services

These are services that the public library may perform either for other libraries or for individuals, organisations or other governmental agencies (Sager, 1989). A form of contract that can be realistically done here is between the public library and other types, particularly school libraries to provide special services such as production of Braille books for the visually impaired students, training school librarians for information literacy teaching. Public libraries in Nigeria can also enter into contract with their respective state governments to supply processed books to their school libraries. Furthermore, public libraries which have the facilities and capacity could enter into contractual relationship with institutions of higher learning which lack the facilities for bindery services.

Charging Users for Services and Membership

The public library can charge special fees for research services and information work for business and private clients. These services are based on quick and excellent information retrieval and/or customised research projects. According to Warner (1987), establishing a successful fee-based operation within the library takes a careful professional planning, detailed needs assessment, energetic marketing, and good business sense and practice. According to Sager (1989), services such as online computer searches could be established and charged for. Online reference services could be paid for to cover the cost of computer connect time and telecommunications.

Another fee-based service is photocopying. The libraries should charge enough to generate surpluses to cover the library's own internal photocopying needs (Lynch. 1988). Public libraries should heed the advice of Sager that if charging a fee makes it possible to offer a service or resource that would otherwise be unavailable, the administrator should certainly consider that approach. Fee-based services can also contribute to corporate giving. If the customers are satisfied, new resource for the public library may be obtained from corporate and related business partners, especially if they are satisfied customers (Rader. 2000).

Memorials

Memorials are a positive means of support to the public library, and will be attractive to Nigerians who can afford it. It involves donating newly acquired books or old but still useful and other library materials in memory of a beloved one. There may be a book plate noting by whom the book/s or material/s was or were donated and in whose memory. Many libraries, according to Sager (1989), have found that memorial gifts can be significant supplements to their book budget and that can sometime lead to substantial gifts or an endowment for additional memorial. To facilitate donations and obviate the possibility of getting materials not needed, public libraries should, in their gift policy, draw up a list of needed projects ready to be suggested to an individual or organisation interested in donating to the library.

Open Access Resources

Provision of access to information is the cardinal objective of the library profession. With limited funding, public libraries in Nigeria can avail themselves of the open access resources in order to improve services. Open access (OA) resources are those online resources that users can access without financial barriers, thus saving money to take care of other needs. One way to access an open access journal is to check the Directory of Open Access Journals (DOAJ). There is also the Open J-Gate, a service launched in early 2006 in India. This is another index to articles published in English language Open Access Journals. One fear which users have expressed over open access resources has to do with the potential doubtful quality of some of these resources. However, out of over 3500 journals indexed by Open J-Gate, about 2000 are peer-reviewed, and that database has provision for limiting a search to peer-reviewed journals only. There is no doubt that access to open access resources will help improve public library services in Nigeria, provided that the public libraries have Internet connectivity in place possibly through cybercafés run by them.

Entrepreneurial Activities

Public libraries in Nigeria need to develop visions and ideas to experiment with new and creative means to fund their libraries. Entrepreneurial ventures such as book trade, printing, publishing, sale of works of art and handicrafts and cyber cafe are good revenue yielding undertakings from which public libraries can supplement their funding. These undertakings require proper planning and staff with entrepreneurial sense. The book depot can be relied upon for un-pirated primary and secondary school textbooks and popular titles. Because of the possibility of lack of initial capital for a take-off, public libraries can go into partnership with publishers in form of franchise.

To ensure the success of the venture, the libraries will need to seek the support and cooperation of their respective state's Universal Basic Education Boards and state governments. Publishing, printing and book trade are business undertakings that public libraries should be familiar with. A public library with the space but without the experts can lease such a space to a private caterer to establish and run a restaurant until such a time when the library is able to have trained staff to manage the enterprise. Being run by a public institution as a staff canteen, such a restaurant is likely to attract the confidence and patronage of the public.

All these need entrepreneurial public librarians led by a proactive, entrepreneurial and innovative directors who will use their vision, ideas and courage to experiment with these new and creative ways to supplement other library funds. Of course, the acid test for the success of any of these entrepreneurial initiatives is its ability to generate surpluses beyond its accurately assessed visible and invisible costs, for growing the quality of the public library services.

Community Aid

In Nigeria, rural communities that are often mostly neglected are usually excited at the prospect of having government presence. To this end, library boards in the country should approach communities for support in establishing branches. Such support could come in form of providing the building and the furniture. With their contribution, the communities would see the library as their own and their constituents will avail themselves of its services. In Edo State in South-South Nigeria, one local government council in 1995 renovated and stocked a branch of the state library in its area. This public library/community partnership will facilitate the establishment of community information services which assist individuals and groups with daily problem-solving and with participation in the democratic process.

Grants from Foundations and Corporate Bodies

Several international agencies such as UNESCO, Carnegie Corporation, Ford Foundation, Rockefeller Foundation, the British Council, Book Aid International (Ranfurly), Books for Africa, etc, have supported public libraries in Nigeria. Some of these agencies such as Book Aid International, have since withdrawn their support to Nigerian libraries for various reasons, some of which may no longer be valid. There is the need to step up action to seek financial support from grant awarding agencies such as the Bill and Melinda Gates Foundation. Grants can be excellent means of supplementing funds for special projects such as bridging information gap through the provision of information and communication technologies. Private grant makers usually avoid donating money for ongoing operating expenses (Ezzell, 1995). They are usually interested in new innovative, special and extra service such as provision of ICTs to bridge existing information gap. It is for this reason that Summerford (1995) noted that donors want to support projects that will empower citizens and result in long-term improvement in the country. Once suitable projects have been identified, it is time to search for grant awarding bodies from the local community, or from regional development, national and global locations. For instance, public libraries within the Niger Delta Region of Nigeria can approach the Niger Delta Development Commission for grants. Some of the international grants awarding organizations are:

Bill and Melinda Gates Foundation: The international library initiatives of the Bill and Melinda Gates Foundation are dedicated to the development of international activities with libraries serving the general public throughout the world to enable all individuals to improve their lives with information and technology.

Access to Learning Award: This award, worth US $1 million, is given each year by the Bill and Melinda Gates Foundations Global Libraries Initiative in recognition of innovative efforts of public libraries or similar organisations outside the United States to connect people to information through free access to computer and the Internet.

Books for All: This is a library project aimed to provide children and young people in developing countries with books. Public libraries wishing to establish small libraries to enlarge existing collections or to improve the quality of school libraries may receive support from this organization.

Guust Van Wesemael Literacy Prize: This award is a contribution to IFLA's efforts to promote literacy in developing countries. Its focus is public library or school library works.

IFLA Funds, Grants and Awards: IFLA administers a number of grants to provide funding for new and exciting projects in the field of librarianship.

It is also important to note that there are many new emerging possible sources of funding for public library services from various non-English countries and organizations (e.g. China) that may be desirous of gaining footholds in the international arena for grant giving. The Internet provides a very valuable tool for discovering them.

Finally, public libraries should recognise the important role of a well written grant project proposal, and the imperative to first understand and follow the guidelines and requirements published by the grant awarding bodies. Consultants may be use in the proposal writing on a commission for success basis.

Inter-Library Networking and Collaboration

The underlining assumption in a network environment is that there is benefit for every participating library. Therefore, a very effective and creative method to stretch public library budgets is through resource sharing (Rader, 2000). Rader observed that libraries have been cooperating with one and another for many years, but that the extent of resource sharing needed at this time and in the future surpasses everything librarians have done previously in this regard. Apart from networking to share resources, Nigerian public libraries need collaborative arrangements for class action pursuit of vigorous public library advocacy and media campaigns across the country on various fronts such as education and literacy conferences and federal and state legislatures.

There are expected potential challenges that associate with library networking efforts including financial constraints, non-availability of equipment, reluctance to standardise and coordinate activities, resource building and sharing, and exchange of information and ideas that comes with such networking (Kar et al, 1999). Also often constraining class action collaboration are the different situations of public libraries in different jurisdictions across the country, as well as regional, political party, leadership and personality divides.

But these problems can be overcome with the right attitude and adequate motivation and dedication, as well as necessary and mutually beneficial compromises. Public libraries in Nigeria may not need to start with a national network or collaborative arrangement, but zonal networks which can merge later into a national one. With the backing of the Nigerian Library Association and its public library interest group, and aggressive promotion and fund-raising by the libraries, the project stands good chances of success.

Conclusion

As government funding of public libraries in Nigeria has declined in most cases, public libraries are in dire need of a diversified funding system. Total reliance on government funding will only lead to perennial incapacity to meet users' growing and changing needs and the concomitant drift of our public libraries into crises of relevance. The various opportunities that have been highlighted and discussed above have been tried successfully in different parts of the world. However, the focus of our public librarians on government sources of funding for their operations and growth appears to have blunted their awareness, appreciation or action towards seeking other sources of funding. Such a stance, apart from depriving Nigerian public libraries of growing and improving services to their publics and clientele, is also depriving public libraries and librarians of public recognition and valuation of their professional abilities and worth. This paper is a clarion call to action for a change in the current situation through vigorous innovative approaches to income generation and budgeting by Nigerian public library directors.

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Dr. Umunna Opara is Reader and Head of Department of Library and Information Science of the Federal Polytechnic, Nekede, Owerri, Imo State, Nigeria. He attended the University of Ibadan, Nigeria where he obtained B.Ed (Hons), MLS and PhD degrees. He is a Fellow of the Nigerian Library Association (FNLA).