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A comparative analysis of available features and Web 2.0 tools on selected Nigerian and South African university library websites

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Abstract

Purpose – The study aims to present a comparative analysis of available Web 2.0 tools in library websites of selected Nigerian and South African universities.

Design/methodology/approach – Content analysis was adopted as the design for the study. Twenty university library websites comprising ten top-ranking Nigerian universities and ten top-ranking South African universities were sampled for data collection. Five research questions developed and answered.

Findings – The findings show that the use of Web 2.0 tools in the selected universities is encouraging. There are more Web 2.0 tools available on the South African university library websites. The South African university libraries are ahead of their Nigerian counterparts in terms of the integration of Web 2.0 tools, e-resources and e-databases and provide platforms for easy retrieval of information by their users. There are more e-resources available on the South African university library websites compared with their Nigerian counterparts. e-Journals are the most available e-resources in the selected university library websites of both countries. Similarly, more academic e-databases are available on the South African university library websites, whereas only few are listed on the web pages of the selected Nigerian university library websites.

Research limitations/implications – Because available studies seem to ignore the possibility of comparing one university library's website with another, conducting a study such as this will provide an insight and idea on the types of features, tools and applications to be included on university library websites. This will be useful for university whose library is planning to develop a website.

Originality/value – Because of the wide variation reported in this study concerning available tools and resources on the university library websites in South Africa and Nigeria, it is recommended that African universities should come up with a standard that will mandate universities to have a certain number of tools identified in this study on their various university websites.

Keywords Nigeria, South Africa, Universities, Web 2.0 tools, Library 2.0, e-Resources, Library websites, Web pages

Paper type Research paper

Introduction

Websites have become a tool used by various individuals, organizations, governments and corporate bodies to explore information and publicize their products and services while showcasing their goals and missions. Basically, websites are used to establish

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businesses and corporations in the general world. The website has enabled creating, processing, sharing and using information in a digital form and is now facilitating the transfer of information in a rapid method to all corners of the world.

Academic institutions use websites to promote their services and advertise their institutions through Web 2.0 platforms. Academic libraries, especially university libraries, also use websites to achieve their goals and objectives, which include acquiring, storing and disseminating information to their users. Burke (2006, p. 149) explained that a library website is a website that provides a library "with a space to share its services and to tell its story to the community it serves". A library which does not have a website is missing the opportunity "for marketing its services and this usually affects the patrons negatively in terms of finding the information they need" (p. 150). In addition to the website itself, libraries must focus on creating and offering interactive services on the site. The benefits of library websites are numerous, including the opportunity for patrons to interact with the library catalog, providing a gateway to electronic resources, allowing remote access to library databases, offering virtual reference services and utilizing a blog to announce new resources or services and provide patrons with an avenue to communicate with staff and get feedback.

The term Web 2.0 refers to a specific category of tools, such as multimedia sharing, rich site syndicate (RSS) feeds, wikis, blogs, social bookmarking, mashups, Facebook, Twitter, MySpace, frequenctly asked question (FAQs), and other interactive tools and their use on websites. Web 2.0 may also refer to the second generation of web development and design that facilitates communication, secures information sharing, provides interoperability and enhances collaboration on the World Wide Web, such as the use of blogs, wikis, online social networking, virtual worlds and other forms of social media (Boateng *et al.*, 2010). Olasina (2011) notes that Web 2.0 is a set of trends and tools required for using the internet. He further explains that these socio-technological innovations have enabled the interactivity and gathering of knowledge through experience and practice on a global scale. Web 2.0 features are tools that encourage the participation and contribution of users in the running of services of the library. Web 2.0 is about sharing and a user's networking with other users. Kumar (2010) states that Web 2.0 websites provide users with information storage, creation and dissemination capabilities that were not possible in environments prior to Web 2.0. The opportunities provided by Web 2.0 to the users of libraries are numerous. Users now have unlimited access to materials, such as e-resources, e-databases, theses and dissertations. Without Web 2.0, this might not have been possible because Web 2.0 provides additional gateways to access these materials.

According to the Staffordshire University (2015), an e-resource is an electronic information resource that can be accessed through the website where users can get the information they want and when they need it, for example, 24 h a day, seven days a week. In other words, an electronic resource is any information source that the library provides access to in an electronic format. e-Resources include full-text electronic journals, online databases, electronic books, company information, encyclopedias, digital images, industry profiles, market research and career information. They are usually accessed through the university's library web page. e-Databases, on the other hand, are a searchable collection of records. These records consist of different types of information that relate in some way to the record. The information is input in categories called fields. Thus, an e-database is an organized collection of information on a

particular subject or multidisciplinary subject areas. The information in an e-database can be searched and retrieved electronically. Contents of electronic databases include journal articles, newspaper articles, book reviews and conference proceedings. All of these are opportunities provided by Web 2.0 in the library to the users. However, the issue of funding by the parent body or the organization affects the availability of these resources. Funding and library policies dictate access to these materials. Experts in charge of ordering, maintenance and management of the services are necessary but add to the cost of the resources. Web 2.0 tools have been beneficial to libraries, as they render more effective services to their library patrons in the electronic environment. These libraries now make use of Web 2.0 to communicate with potential library users and extend the services provided to individual libraries. Web 2.0 tools serve as an avenue for libraries for outreach and collaboration purposes for students and other users.

The application of various Web 2.0 features on the library website has brought about the term Library 2.0, which was coined by Michael Casey in 2005 who saw Library 2.0 as being "user-centred change" (Casey and Savastinuk, 2006). Many university libraries have developed websites to promote their services, although Han and Liu (2010) note that some characteristics are present in some websites but not in others. The available studies seem to ignore the possibility of comparing one university library's website with another. Conducting a study such as this will provide an insight and ideas on the types of features, tools and applications that would be beneficial to library websites. This will be useful for the university whose library is planning to develop a website. Hence, this study is a comparison of the websites of selected university libraries in Nigeria and South Africa.

Objective of the study

The main objective of this study is to compare a variety of university library websites in Nigeria and South Africa. These two countries were chosen because they have universities that have incorporated a number of web applications on their websites. These two countries also have the highest number of university libraries in Africa whose websites are fully functional. The specific objectives of this study are to:

- identify the leading Nigerian and South African universities along with their library websites and universal resource locators (URLs) for use in the study;
- determine the Web 2.0 tools available on the Nigerian and South African university library websites and web pages;
- compare the web contents and e-resources available on the Nigerian and South African university library websites;
- determine the electronic databases listed on the websites; and
- examine the main differences between the Web 2.0 tools available on the Nigerian and South African university library websites.

Research questions

To achieve the aforementioned objectives, the following research questions were developed and answered in the study:

RQ1. What are the websites and URLs of the leading Nigerian and South African universities?

RQ2. What are the common features and Web 2.0 tools available on the selected Nigerian and South African university library websites and web pages?

RQ3. What are the web contents and e-resources available on the websites of the selected Nigerian and South African university libraries?

RQ4. Which e-databases are listed on the selected Nigerian and South African university library websites?

RQ5. What are the differences between the Web 2.0 tools available on the Nigerian and South African university library websites?

Literature review

Bao (2000) describes a library's home page as a new platform that represents the delivery of library services. Kehinde and Tella (2012) note that the vast majority of library services are now web-enabled, and, thus, attention is being focused on designing user-friendly, easily managed and well-maintained websites. Designing user-friendly websites ensures easy access by users.

Burke (2006) emphasized that the library website provides a library with a space to share its service and tell its story to the community it serves. The library also provides users with access to information at remote sites (Halsey, 2006). The availability of these university library websites laid the foundation for "social navigation", which has influenced web users around the world (Morville and Rosenfeld, 2007). The library website provides a platform for the librarian–user interaction. Academic libraries create more value with social networking profiles "by offering a space for patrons to give feedback, by providing news and information, or by providing a portal to library services" (Farkas, 2007, p. 122). The opinions of the patrons/users are well expressed through this medium. Putting in place a website for a library does not just end with a beautiful design but should also include specific infrastructures that ensure creativity, communication and collaboration.

Web 2.0 applies various features to a standard website to ensure the participation of users in the running of the library. Users have become contributors, and the services are harnessing their collective intelligence (O'Reilly, 2005). Web 2.0 provides an avenue for information sharing and cross-platform flexibility. Web 2.0 services are becoming a part of primary online activities by library patrons when accessing information. As part of the measures taken by academic libraries to incorporate Web 2.0 tools in their websites, the idea of Library 2.0 was developed. Library 2.0 is a new way of providing library services through new internet technologies, with emphasis on user-centered change and interaction. Library 2.0 allows for easy updating and evaluation of library services to meet the changing needs of library users. Library 2.0 also calls for libraries to encourage user participation and feedback in the development and maintenance of library services. Because websites are now accepted by most academic libraries, many researchers have written and published papers on the subject area in various journals.

A number of studies have been conducted on the features of university and library websites and the integration of Web 2.0 tools. However, very few of these studies have been conducted in Nigeria or South Africa. Therefore, related studies on Web 2.0 tools integration by African university libraries in general are reviewed. Lwoga (2014) examined the effort of the Muhimbili University of Health and Allied Sciences (MUHAS) library on the integration of Web 2.0 technologies in its functions to enhance the quality

of its services in Tanzania. The study used an exploratory questionnaire survey to assess user requirements among undergraduate medical students at MUHAS, which included Library 2.0 services, conducting training and creating awareness. The findings showed that Web 2.0 technologies can be implemented effectively according to university goals, user needs, deployment of user-friendly tools and capacity building among librarians and users. The study also reported that students positively supported the adoption of Library 2.0 services because they improved the quality of the MUHAS library services. In addition, challenges reported in the study are those related to the infrastructure, awareness, literacy, inadequate staff, security and ownership of Web 2.0 services. The study emphasized that the findings may not be widely replicated because it is based on a case study of the integration of Web 2.0 technologies into the library functions of MUHAS. Lwoga's (2014) study is thus different from this current study, as Lwoga examined only one university in Tanzania and the way the library integrated Web 2.0 tools on the website. The current study, however, is a comparison of features and Web 2.0 tools in selected university library websites in both Nigeria and South Africa. Although the current study can generalize its findings to all universities in Africa, the former study by Lwoga could not generalize its findings to the universities in Tanzania because of its limited scope. Moreover, Lwoga's (2014) study used a questionnaire survey to assess user requirements among undergraduate medical students, whereas the current study adopted a content analysis method by using a checklist to gather data from the websites of selected university libraries. Muneja and Abungu (2012) explored the adoption and application of Web 2.0 tools in delivering library services in selected libraries in Tanzania. The paper investigates the ways in which librarians are adopting the tools to enhance their services, how tools are used to deliver services, factors influencing the use of Web 2.0 tools, challenges and prospects in their usage. The findings revealed that librarians in Tanzania have started using various Web 2.0 tools to varying degrees, with the most common tool being Facebook. The findings also demonstrated that most librarians are motivated to use these tools because they are free and relatively easy to use and apply. Sharing resources, communication and promotion of services are the main reasons why these tools were used. Challenges included unreliable power and internet access. Advantages included an increase in resource awareness, improved communication and enhanced interest in library use. The authors recommended that institutions should develop policies that adopt the use of emerging technologies and alternatives to reliable power sources, such as solar energy and generators.

Oyieke (2012) explored the prevalence and use of select Web 2.0 tools in university libraries in Kenya. The study assessed the current status of Web 2.0 tools and advocated for ideas that may help nurture best practices in the use of social networking sites as information sources. Content analysis was adopted as the methodology for answering two research questions. A checklist comprising two items was used to analyze the libraries' application and the use of Twitter and Facebook. Kenya has a total of 27 universities, 7 public (state-owned) and 20 private (owned by independent bodies mostly with some religious affiliations). The results showed that a total of 10 (37 per cent) university libraries in Kenya have a link to Twitter, whereas 14 (52 per cent) have a link to Facebook pages as part of their services to users. However, only five (19 per cent) university libraries indicated an active use of Facebook and Twitter. The five university libraries used their Twitter and Facebook pages for marketing and creating awareness

of library services to their users. These findings are not conclusive because it is a work in progress. However, current findings indicate that university libraries in Kenya have not yet developed scholarly online communities, which can engage users in conversations or discussions aimed at creating and consuming content, and therefore, participating equitably in the knowledge society. These two studies focused on the adoption and application of Web 2.0 tools for delivering library services, as well as the prevalence and use of selected Web 2.0 tools in university libraries in both Tanzania and Kenya, whereas the current study is focused on the comparison of available features and Web 2.0 tools on university library websites.

Kehinde and Tella (2012) assessed university library websites in some selected university libraries in Nigeria. The study used content analysis as the research design. A total of 30 university library websites were selected from the three categories of universities in Nigeria to represent a purposive stratified sampling technique. A checklist was used as the research instrument. The criteria for the checklist were drawn on the basis of the assessment of library websites for Web 2.0 tools, access to electronic materials and a link to the Nigerian University Commission virtual library. Four research questions were developed and answered, and the results revealed a low level of integration of Web 2.0 tools on most of the websites. The study concluded that the use of current web development technologies for deploying mainstream web information services was not widespread. Majority of university libraries were found to be working within conventional library settings, and the diffusion rate of web information services was relatively low. Based on the conclusions, the study recommended that Web 2.0 tools should be used as part of the accreditation criteria for university libraries or for university ranking by various organizations involved in webometrics.

Looking at these previous studies, it can be deduced that many universities are either at an early stage of integrating Web 2.0 tools or may be planning to do so. From the literature, it is also observed that a limited number of previous studies have considered a comparison of Web 2.0 features available in selected university library websites of two countries, specifically in Africa. This study, therefore, is an attempt to bridge this gap. Hence, it examines a comparative analysis of Web 2.0 features in selected Nigerian and South African universities.

Methodology

The study used content analysis of library websites to collect data on the variables in the study, including Web 2.0, electronic resources and e-databases. The choice of this method was informed by its use in previous related studies, including Ovaska and Leino (2008) and Si *et al.* (2009, 2011). The study commenced in January 2013 and was completed by June 2013. Content analysis was conducted from March 2013 to June 2013.

Population of the study

The top 10 universities from the ranked list of 100 in Africa provided on the 4icu.org website (www.4icu.org/topAfrica/) in the February 2013 edition were considered for collection of data. From this list, 20 universities were selected according to their ranking. These are the ten best universities in Nigeria and ten best universities in South Africa. For each of the universities, their library website was visited, and data on their Web 2.0 features (such as blogs, RSS, instant messaging and wikis), electronic resources and e-databases were collected and analyzed.

The e-resources available and links to databases, website content written in English and other characteristics formed the units of analysis. A list of the selected universities, their abbreviations and URLs are provided in Table I.

Data collection procedures

The researchers searched through the web pages of each university library's website to identify Web 2.0 tools, electronic resources and links to online databases. The items covered by the study are as follows:

- *Web 2.0 tools*: These are revolutionary web tools used by most libraries for media literacy, technological proficiency, global awareness and for creating, collaborating, editing and sharing user-generated content online.
- *e-Resources*: These are bibliographic or full-text databases that allow library users to search for relevant articles in their subject area. They can be references to books or journals that have been made available in an electronic format, a set of web pages or a compact disc read only memory (CD-ROM) the library makes available to users via their web page.
- *Online databases*: An online database or e-database is an organized collection of information on a particular subject or multidisciplinary subject areas, which can be searched and retrieved electronically. The contents include journal articles, newspaper articles, book reviews and conference proceedings and are usually updated on a daily, weekly, monthly or quarterly basis. e-Databases can be full-text or bibliographic. Examples include the suite of EBSCOhost databases,

Table I. Sampled websites with abbreviations and URLs

No.	University	Abbreviation	URL
Nigeria			
1	Ahmadu Bello University	ABU	www.abu.edu.ng
2	Federal University of Agriculture, Abeokuta	FUNAAB	www.unaab.edu.ng
3	Obafemi Awolowo University	OAU	www.oauife.edu.ng
4	University of Benin	BENIN	www.uniben.edu.ng
5	University of Ibadan	IBADAN	www.ui.edu.ng
6	University of Ilorin	ILORIN	www.unilorin.edu.ng
7	University of Jos	JOS	www.unijos.edu.ng
8	University of Lagos	UNILAG	www.unilag.edu.ng
9	University of Maiduguri	MAIDUGURI	www.unimaid.edu.ng
10	University of Port Harcourt	UNPORT	www.uniport.edu.ng
South Africa			
11	Rhodes University	RHODES	www.ru.ac.za
12	North-West University	NWU	www.nwu.ac.za
13	University of Cape Town	UCT	www.uct.ac.za
14	University of Johannesburg	UJ	www.uj.ac.za
15	University of KwaZulu-Natal	UKZN	www.ukzn.ac.za
16	University of Pretoria	UP	www.up.ac.za
17	University of South Africa	UNISA	www.unisa.ac.za
18	University of Stellenbosch	UNISTEL	www.sun.ac.za
19	University of Western Cape	W/CAPE	www.uwc.ac.za
20	University of Witwatersrand	WIT	www.wits.ac.za

ProQuest databases, Scopus, AGORA and Questia, among others. The study identified and compared the common Web 2.0 tools, e-resources and e-databases available on the web pages of the selected university library websites in both countries. The results are presented in Tables II-X.

Results

Web 2.0 tools

Table II and III show the availability of 13 common Web 2.0 tools on the websites of the selected Nigerian and South African university library websites, respectively.

Table II and III show that a total of 55 occurrences of the 13 Web 2.0 tools were identified and assessed. The tables reveal that Facebook and Twitter are the most common tools on the websites of the selected university libraries in both countries, with a total of 15 occurrences of Facebook and 13 of Twitter (Table IV). These two tools alone

	ABU	FUNAB	OAU	UI	UNIBEN	UNIJOS	UNILAG	UNILORIN	MADUGURI	UNIPORT	Total
Blog	0	0	0	1	0	1	0	0	0	0	2
Delicious	0	0	0	0	0	0	0	0	0	0	0
Digg	0	0	0	0	0	0	0	1	0	0	1
Facebook	0	0	0	1	1	1	1	1	1	1	7
Flickr	0	0	0	0	0	0	0	0	0	0	0
Google+	0	0	0	0	0	0	0	0	1	1	2
LinkedIn	0	0	0	0	0	0	0	1	0	0	1
Meebo	0	0	0	0	0	0	0	1	0	0	1
Podcasts	0	0	0	1	0	0	0	0	0	0	1
RSS	0	0	0	0	0	0	0	0	0	1	1
Stumble	0	0	0	0	0	0	0	0	0	0	0
Twitter	0	0	0	1	0	1	1	1	1	1	6
YouTube	0	0	0	0	0	0	0	0	0	1	1
Total	0	0	0	4	1	3	2	5	3	5	23

Table II.
Popular Web 2.0 tools available on the websites of Nigerian university libraries

	Rhodes	NWU	UCT	UJ	UKZN	UNISA	UNISTEL	UP	W/CP	WITT	Total
Blog	0	0	0	0	0	0	0	0	1	0	1
Delicious	0	0	0	0	0	0	0	0	0	1	1
Digg	0	0	0	0	0	0	0	0	0	1	1
Facebook	0	1	1	1	0	1	1	1	1	1	8
Flickr	0	0	1	0	0	0	0	0	0	0	1
Google+	0	1	0	0	0	0	0	0	0	0	1
LinkedIn	0	1	1	1	0	0	0	0	0	1	4
Meebo	0	0	0	0	0	0	0	0	0	0	0
Podcasts	0	0	0	0	0	0	0	0	0	0	0
RSS	0	1	0	1	1	0	1	0	0	1	5
Stumble	0	0	0	0	0	0	0	0	0	1	1
Twitter	1	1	1	1	0	1	0	1	1	0	7
YouTube	0	0	0	0	0	1	0	0	0	1	2
Total	1	5	4	4	1	3	2	2	3	7	32

Table III.
Popular Web 2.0 tools available on the websites of selected South African university libraries

accounted for 50.9 per cent of all tools available on the websites of the selected universities.

A total of 23 Web 2.0 tools (41.8 per cent of the Nigerian total) are available on the Nigerian university library websites, with the University of Ilorin and the University of Port Harcourt providing five tools (9.1 per cent) each, followed by the University of Ibadan with four (7.3 per cent), the University of Jos and the University of Maiduguri with three (5.5 per cent) each, the University of Lagos with two and the University of Benin with one Web 2.0 tool. Libraries of three Nigerian universities – Ahmadu Bello, Federal University of Agriculture Abeokuta and Obafemi Awolowo University – did not have any Web 2.0 tools on their websites at the time the study was conducted.

In South Africa, the library website of the University of the Witwatersrand has seven Web 2.0 tools (12.7 per cent of the South African total), followed by North-West University with five (9.1 per cent), the University of Cape Town and the University of Johannesburg with four tools (7.3 per cent) each, the University of Western Cape and the University of South Africa with three tools (5.5 per cent) each, the University of Stellenbosch and the University of Pretoria with two tools (3.6 per cent) each, and Rhodes University and the University of KwaZulu-Natal with one tool (1.8 per cent) each, as shown in Table III.

Table IV shows a summary comparison of the common Web 2.0 tools available on all the selected university library websites in Nigeria and South Africa. The table shows that two tools – Meebo and podcasts – are available on Nigerian library websites but not on South African library websites. By contrast, there are three tools – Delicious, Flickr and Stumble – which are available on South African library websites but not on Nigerian library websites, and that the South African library websites have more examples of Facebook, LinkedIn, RSS feeds and Twitter than the Nigerian library websites. Both groups have the same numbers of Digg links. Overall, the South African university library websites accounted for 58.2 per cent of the total of 55 tools used in both countries, whereas the Nigerian university library websites comprised 41.8 per cent of the total tools available.

Table IV. Summary comparison of common Web 2.0 tools available on the websites of selected university libraries in South Africa and Nigeria

	Nigeria	South Africa	Total
Blog	2	1	3
Delicious	0	1	1
Digg	1	1	2
Facebook	7	8	15
Flickr	0	1	1
Google+	2	1	3
LinkedIn	1	4	5
Meebo	1	0	1
Podcasts	1	0	1
RSS	1	5	6
Stumble	0	1	1
Twitter	6	7	13
YouTube	1	2	3
Total	23	32	55
Percent	41.8	58.2	

e-Resources

Tables V and VI show that a total of 65 occurrences of 12 web contents/e-resources were identified and assessed. The tables reveal that e-journals and e-books are the most common e-resources found on the websites of the selected university libraries in both countries. A total of 13 universities (20 per cent) in both countries feature e-journals, whereas 14 universities (21.5 per cent) feature e-books on their library websites. This is followed by theses and dissertations, which are found on the websites of nine libraries (13.9 per cent), and news sources, which are found on the library websites of nine universities (13.9 per cent). Past examination papers and e-reference items were found on the library websites of five universities (7.7 per cent) each, whereas e-catalogues were found on the websites of four universities (6.2 per cent). WorldCat was only found on the library websites of three universities. Other

	ABU	FUNAB	OAU	UI	UNIBEN	UNIJOS	UNILAG	UNILORIN	MADUGURI	UNIPORT	Total
Bibliographies	0	0	0	0	0	0	0	0	0	0	0
Dictionaries	0	0	0	0	0	0	0	1	0	0	1
e-Books	1	1	0	1	0	0	0	1	0	1	5
e-Catalogues	1	0	0	0	0	0	0	0	0	1	2
e-Journals	1	1	1	1	0	0	0	0	0	1	5
e-References	0	0	0	0	0	0	0	0	0	0	0
Encyclopedias	0	0	0	0	0	0	0	1	0	0	1
Manuscripts	0	0	0	0	0	0	0	0	0	0	0
News	1	0	0	0	0	0	1	1	1	1	5
Past exams	0	0	0	0	0	0	0	0	0	0	0
Theses and dissertations	0	1	0	0	0	1	0	0	0	0	2
WorldCat	0	0	0	0	1	0	0	1	0	0	2
Total	4	3	1	2	1	1	1	5	1	4	23

Table V.
Common web content displayed on selected Nigerian university library webpages

	Rhodes	NWU	UCT	UJ	UKZN	UNISA	UNISTEL	UP	W/CP	WITT	Total
Bibliographies	0	0	1	0	0	0	0	0	0	0	1
Dictionaries	0	0	0	0	0	0	0	0	0	0	0
e-Books	1	1	1	0	1	1	1	1	1	1	9
e-Catalogues	0	1	0	1	0	0	0	0	0	1	3
e-Journals	0	1	1	0	1	1	1	1	1	1	8
e-References	0	0	0	0	0	1	0	1	1	0	3
Encyclopedias	0	0	0	0	0	0	0	0	0	0	0
Manuscripts	0	0	1	0	0	0	0	0	0	0	1
News	0	1	0	1	1	0	0	1	0	0	4
Past exams	1	1	0	1	1	0	0	0	0	1	5
Theses and dissertations	1	1	0	1	1	1	0	1	0	1	7
WorldCat	0	1	0	0	0	0	0	0	0	0	1
Total	3	7	4	4	5	4	2	5	3	5	42

Table VI.
Common web contents/e-resources displayed on selected South African university library webpages

e-resources such as bibliographies, dictionaries, encyclopedias and manuscripts were each found on the website of one university library in both countries.

Table VII provides a summary comparison of the common web contents/e-resources available on the selected university library websites in Nigeria and South Africa. The results show that out of the total of 65 web contents available on the selected university library websites in both countries, Nigerian university library websites have 23, representing 35.4 per cent, whereas South African university library websites have 42, representing 64.6 per cent. The Nigerian university library websites feature bibliographies, e-reference services, manuscripts and past exam papers. e-Resources such as encyclopedias and dictionaries are available on the Nigerian university library websites but not on South African university library websites. The web contents commonly available on Nigerian university library websites are e-books, e-journals and news. Each of them is found on five university library websites, followed by e-catalogues, theses and dissertations and WorldCat, each available on three university library websites, whereas dictionaries and encyclopedias are available on one university library website each. On the South African university library websites, there are e-books on nine university library websites, e-journals on eight websites and theses and dissertations on seven websites.

Online databases

Table VIII and IX show that a total of 64 occurrences of the 13 e-databases were identified and assessed. The tables reveal that 11 universities (17.2 per cent) from both countries have EBSCOhost. This is followed by JSTOR with ten universities, representing 15.6 per cent. ProQuest is available on eight (12.5 per cent) university library websites. Online public access catalogues (OPACs) are available on seven websites, whereas online computer library center (OCLC) is available on six websites (9.4 per cent). Aluka and AGORA are available on five sites each (7.8 per cent), followed by Hinari and South Africa based information network (SABINET), which are available on four websites (6.3 per cent) each. Other databases – Alep, e-Granary, Eolss and Oare – are found on the website of one university each.

Table VII.
Comparison of web contents/e-resources displayed on the Nigerian and South African university library websites

	Nigeria	South Africa	Total
Bibliographies	0	1	1
Dictionaries	1	0	1
e-Books	5	9	14
e-Catalogues	2	3	5
e-Journals	5	8	13
e-References	0	3	3
Encyclopedias	1	0	1
Manuscripts	0	1	1
News	5	4	9
Past exams	0	5	5
Theses and dissertations	2	7	9
WorldCat	2	1	3
Total	23	42	65

	ABU	FUNAB	OAU	UI	UNIBEN	UNIJOS	UNILAG	UNILORIN	MADUGURI	UNIPORT	Total
AGORA	0	1	1	0	0	0	1	1	0	1	5
Alep	0	0	0	0	0	0	0	0	0	0	0
Aluka	0	0	0	0	0	0	0	0	0	1	1
EBSCOhost	0	0	1	0	0	0	1	1	0	1	4
e-Granary	0	0	0	0	0	1	0	0	0	0	1
Eolss	0	0	0	0	0	0	0	0	0	1	0
Hinari	0	0	1	0	0	0	1	1	0	1	4
JSTOR	0	0	0	0	0	0	1	1	0	1	3
Oare	0	0	0	0	0	0	0	0	0	1	1
OCLC	0	0	1	0	0	0	0	0	0	0	1
OPAC	0	1	0	1	0	1	0	1	0	1	5
ProQuest	0	0	0	0	0	0	0	0	0	1	1
SABINET	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	4	1	0	1	4	5	0	9	26

Table VIII.
e-Databases listed on the web pages of the selected Nigerian university library websites

	Rhodes	NWU	UCT	UJ	UKZN	UNISA	UNISTEL	UP	W/CP	WITT	Total
AGORA	0	0	0	0	0	0	0	0	0	0	0
Alep	0	0	1	0	0	0	0	0	0	0	1
Aluka	1	0	0	0	1	0	0	1	0	1	4
EBSCOhost	1	1	0	1	1	0	1	1	1	0	7
e-Granary	0	0	0	0	0	0	0	0	0	0	0
Eolss	0	0	0	0	0	0	0	0	0	0	0
Hinari	0	0	0	0	0	0	0	0	0	0	0
JSTOR	1	1	0	1	1	0	1	1	1	0	7
Oare	0	0	0	0	0	0	0	0	0	0	0
OCLC	1	0	0	0	1	0	1	1	1	0	5
OPAC	0	1	0	0	1	0	0	0	0	0	2
ProQuest	1	0	0	1	1	0	1	1	1	1	7
SABINET	0	1	0	0	1	0	1	0	1	0	4
Total	5	4	1	3	7	0	5	5	5	2	37

Table IX.
e-Databases listed on the web pages of the selected South African university library websites

Table X shows a summary of the comparison of the common e-databases available on all the selected university library websites. There are 27 e-databases (42.2 per cent) available on the Nigerian library websites, whereas 37 (57.8 per cent) are available on the South African library websites. Among the Nigerian universities, the University of Port Harcourt has the highest number of e-databases (nine, 14.1 per cent), followed by the University of Ilorin (five, 7.8 per cent) and the Obafemi Awolowo University and the University of Lagos with four e-databases each (6.3 per cent). The Federal University of Agriculture Abeokuta and the University of Jos have two e-databases (3.1 per cent) each on their university library websites. In South Africa, the University of KwaZulu-Natal has the highest number (seven, 10.9 per cent) of e-databases and the University of Pretoria, the University of Stellenbosch, Rhodes University and the University of Western Cape each have five e-databases (7.8 per cent).

Discussion

The research questions were analyzed based on the broad objectives of the study. The main objective of the study was to make a comparative analysis of Web 2.0 tools available on selected Nigerian and South African university library websites. The specific objectives of the study were to:

- identify the leading Nigerian and South African universities with their library websites and URLs;
- determine the popular Web 2.0 tools available on the websites;
- compare the e-resources available on the websites;
- determine the databases listed on the websites; and
- determine the differences between the common Web 2.0 tools available on the Nigerian and South African university library websites.

A thorough assessment of the web pages shows that the selected South African libraries are a little ahead in making Web 2.0 tools available on their university library websites, whereas only a few have been integrated on the Nigerian university library web pages. The status of Web 2.0 applications on library websites can be considered to be in the developing stage in South African libraries. This is reflected in the total of 55 available Web 2.0 tools of which South African university library websites have 32, whereas the Nigerian university library websites share the remaining 23. It is clear that the diffusion rate of Web 2.0 tools is higher among the South African universities compared with Nigerian universities. This is similar to results reported by Kehinde and Tella (2012); they reported that the display of Web 2.0 tools on the university library websites is just beginning in Nigeria, and this is why only a few of these tools are integrated on their libraries' web pages.

Moreover, this study revealed that Facebook and Twitter are the most common Web 2.0 tools available on both the Nigerian and South African university library websites. This result agrees with those reported by Muneja and Abungu (2012) who reported that Facebook was the most common Web 2.0 tool integrated on the

Table X. Comparison of e-databases available on the web pages of selected Nigerian and South African university library websites

	Nigeria	South Africa	Total
AGORA	5	0	5
Alep	0	1	1
Aluka	1	4	5
EBSCOhost	4	7	11
e-Granary	1	0	1
Eolss	1	0	1
Hinari	4	0	4
JSTOR	3	7	10
Oare	1	0	1
OCLC	1	5	6
OPAC	5	2	7
ProQuest	1	7	8
SABINET	0	4	4
Total	27	37	64

university library websites in their study conducted in Tanzania. Similarly, this study is also consistent with that of Oyieke (2012) who noted that more than 50 per cent of the university library websites in the study conducted in Kenya have links to Twitter and Facebook, thereby confirming that these two Web 2.0 tools are the most frequently available tools on Tanzanian and Kenyan university library websites. This finding implies that Facebook and Twitter are the two Web 2.0 tools available on the library websites of most university libraries across Africa.

Regarding the web content/e-resources available on the websites of both Nigerian and South African university library websites, the result shows that e-journals and e-books are prominent on the web pages in both countries. Both are attracting particular interest in academic settings. Electronic theses and dissertations are another prominent e-resources noted in this study. Theses and dissertations are relevant for reference purposes in the electronic academic environment. These e-resources, however, are less available on the Nigerian web pages. Most libraries in Nigeria have not made available some of the e-resources on their university library websites, whereas South African university libraries have already made the resources available. It is observed that the addition of any e-resource by a selected university library website depends on the growth of the library web page and the demand by the users. Hence, it may be that South African university libraries have patrons desiring more electronic resources be available from their websites.

The fourth objective was to identify the e-databases listed on the web pages of the selected Nigerian and South African university library websites. South African libraries have more e-databases than Nigerian libraries. It is possible that the South African libraries have put more emphasis on e-databases, and thus have a greater number of e-databases available. Nigerian university libraries have fewer e-databases on their web pages (27 out of the 64 e-databases). The reason for this might be connected with the cost of acquiring these databases, as funds are not readily available to Nigerian universities. It may also be that the universities focused only on specific e-databases, rather than those that cover wide subjects like their South African counterparts.

The fifth objective was to determine the main difference between common Web 2.0 tools available on the Nigerian and South African university library websites. The results revealed that the South African university library websites contain a number of advertisements for programs, services and activities offered by the library, including seminars and library orientation. This can be a form of current awareness service or selected dissemination of information. However, the web pages of the selected Nigerian university libraries are simple and contain only a few words. The web pages look insufficient with limited contents, showcasing the activities of the library. The design of the websites of most of the library web pages of the selected South African universities is more appealing. They are attractive because of the color design and templates, whereas most of the library web pages in the selected Nigerian universities are not properly designed and are less appealing. Furthermore, the South African library websites give their users the opportunity to interact with the library through the effective use of Web 2.0 tools, whereas this opportunity is limited as far as their Nigerian counterparts are concerned.

Some of the variations listed above, as far as the university library web pages in the two countries, can be attributed to funding. At the moment, South African and

Nigerian universities are incomparable in terms of number. The number of universities in Nigeria is currently double, if not triple, those in South Africa. It should be noted that the funding of all these universities in Nigeria is dependent on the government. However, there are limits to what the government alone can provide. Meeting the needs of all these universities at the same time, in terms of funding, to make provision for all necessary Web 2.0 tools might be difficult but not impossible. South African universities may be enjoying good funding from their government because they are limited in number. With good funding, the South African universities can afford to make provision for all necessary and useful Web 2.0 tools and other important databases and resources.

Conclusion

The introduction of information and communication technology in libraries has changed the way library activities and operations are conducted. Creating an enabling environment for users to operate on a platform that ensures easy access to needed information in the presence of a large volume of information in the library is a very good transformation.

This research shows that there are more Web 2.0 tools available in the selected university library web sites in South Africa than in Nigeria. Indirectly, the results demonstrate that South African universities seem to utilize the potentials of these tools more effectively than Nigerian universities. The study has shown clearly that most Nigerian university library websites have a limited number of Web 2.0 tools. With these results, it can be concluded that the availability of Web 2.0 tools on both the countries' university library websites is incomparable. This is because South African universities seem to be ahead of Nigerian universities in making available Web 2.0 tools, e-resources and e-databases on their university library websites.

Recommendations

This study demonstrated that South African universities are growing in terms of making Web 2.0 tools, e-resources and e-databases available on their websites, compared with their Nigerian counterparts. In the light of this, Nigerian and other African universities that have limited Web 2.0 tools on their library websites should follow the footsteps of South African universities. They should endeavor to make relevant Web 2.0 tools available on their library websites. Doing so will allow their users to enjoy online reference services and other related activities.

To make the dream of globalized learning realizable, university libraries and academic libraries have work to do. This includes making information materials, such as e-resources and e-databases, available on their library websites. This will enable users to have unhindered access to the materials anytime anywhere through Web 2.0 tools. In view of this, universities all over Africa should come up with a standard which will mandate their libraries to have a certain number of Web 2.0 tools, e-resources and e-databases available via their university library websites. This will facilitate their services, especially the online reference sources.

University libraries in Africa should consider updating and modifying their websites to accommodate more Web 2.0 tools, e-resources and e-databases. This is because the current information society is both dynamic and changing, and, as a result, new technologies and tools keep emerging. As they are emerging, library

users want to make use of them. Thus, patrons will more likely patronize a library that has them, as the tools enhance access to information resources.

It should be noted that access to electronic resources and databases is highly tied to funding. Web 2.0 functionality on websites is also tied to funding, though in a different way. For instance, to implement Web 2.0 tools on a website, there are staffing considerations and logistics of website infrastructure. Electronic journals and databases are typically paid for by subscriptions through the university. Access to theses and dissertations is another separate component relying on the policies of the university or the willingness of the authors of the theses and dissertations to make their work available. In light of this, university libraries implementing Web 2.0 features on their websites should make adequate funds available to finance these projects.

References

Bao, X-M. (2000), "Academic library homepages: link location and database provision", *Journal of Academic Librarianship*, Vol. 26 No. 3, pp. 191-196.

Boateng, R., Mbarika, V. and Thomas, C. (2010), "When Web 2.0 becomes an organizational learning tool: evaluating Web 2.0 tools", *Development and Learning in Organizations*, Vol. 24 No. 3, pp. 17-20.

Burke, J.J. (2006), *Neal-Schuman Library Technology Companion: A Basic Guide for Library Staff*, Neal-Schuman, New York, NY.

Casey, M.E. and Savastinuk, L.C. (2006), "Library 2.0: service for the next-generation library", *Library Journal*, Vol. 130 No. 14, p. 40.

Farkas, M. (2007), *Social Software in Libraries: Building Collaboration, Communication and Community Online*, Information Today, Newark, NJ.

Halsey, R.S. (2006), *Library (institution) Microsoft Encarta 2006 [CD]*, Microsoft Corporation, Redmond, WA, pp. 35-40.

Han, Z. and Liu, Y.Q. (2010), "Web 2.0 applications in top Chinese university libraries", *Library Hi Tech*, Vol. 28 No. 1, pp. 41-62.

Kehinde, A.A. and Tella, A. (2012), "Assessment of Nigerian university library websites/webpages", *New Review of Information Networking*, Vol. 17 No. 2, pp. 69-92.

Kumar, S.A. (2010), "Knowledge management and new generation of libraries information services: a concept", *International Journal of Library and Information Science*, Vol. 1 No. 2, pp. 24-30.

Lwoga, E.T. (2014), "Integrating Web 2.0 into an academic library in Tanzania", *The Electronic Library*, Vol. 32 No. 2, pp. 183-202.

Morville, P. and Rosenfeld, L. (2007), *Information Architecture for the World Wide Web*, 3rd ed., O'Reilly, Beijing, pp. 55-65.

Muneja, P.S. and Abungu, A.K. (2012), "Application of Web 2.0 tools in delivering library services: a case of selected libraries in Tanzania", paper presented at the SCECSAL XXth Conference, Nairobi, 4-8 June.

Olasina, G. (2011), "The use of Web 2.0 tools and social networking sites by librarians, information professionals, and other professionals in workplaces in Nigeria", *PNLA Quarterly*, Vol. 75 No. 3, pp. 10-15.

O'Reilly, T. (2005), "What is Web 2.0: design patterns and business models for the next generation of software", available at: https://mpra.ub.uni-muenchen.de/4578/1/MPRA_paper_4578.pdf (accessed 26 December 2015).

Ovaska, S. and Leino, J. (2008), "A survey on Web 2.0", available at: www.cs.uta.fi/reports/dsarja/D-2008-5.pdf (accessed 26 December 2015).

Oyieke, L.I. (2012), "Leveraging university libraries through Web 2.0: implications for academic librarians and the scholarly online communities in Kenya", paper presented at the SCECSAL XXth Conference, Nairobi, *4-8 June*.

Si, L., Shi, R. and Chen, B. (2009), "A survey of the application of Web 2.0 in top 30 Chinese university libraries", *Second International Symposium on Knowledge Acquisition and Modeling, KAM*, Vol. 2, pp. 135-138.

Si, L., Shi, R. and Chen, B.C. (2011), "An investigation and analysis of the application of Web 2.0 in Chinese university libraries", *The Electronic Library*, Vol. 29 No. 5, pp. 651-668.

Staffordshire University (2015), "What are e-resources and how do i find them?", available at: www.staffs.ac.uk/support_depts/infoservices/faq/eresources.jsp (accessed 25 June 2015).

Appendix

Table AI.
Selected university web sites in Nigeria and South Africa with their URLs

No.	University	URL
Nigeria		
1	Ahmadu Bello University	www.abu.edu.ng
2	Federal University of Agriculture, Abeokuta	www.unaab.edu.ng
3	Obafemi Awolowo University	www.oauife.edu.ng
4	University of Benin	www.uniben.edu.ng
5	University of Ibadan	www.ui.edu.ng
6	University of Ilorin	www.unilorin.edu.ng
7	University of Jos	www.unijos.edu.ng
8	University of Lagos	www.unilag.edu.ng
9	University of Maiduguri	www.unimaid.edu.ng
10	University of Port Harcourt	www.uniport.edu.ng
South Africa		
11	Rhodes University	www.uct.ac.za/www.ru.ac.za
12	North-West University	www.nwu.ac.za
13	University of Cape Town	www.uct.ac.za
14	University of Johannesburg	www.uj.ac.za
15	University of KwaZulu-Natal	www.ukzn.ac.za
16	University of Pretoria	www.up.ac.za
17	University of South Africa	www.unisa.ac.za
18	University of Stellenbosch	www.sun.ac.za
19	University of Western Cape	www.uwc.ac.za
20	University of Witwatersrand	www.wits.ac.za

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