The Changing Nature of Academic Libraries Service Delivery: Taking the Library with You!

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ABSTRACT— ***The fundamental objective of a library is to make available reliable information to their clientele in a timely, accurate, pertinent manner. With the advent of Information and Communication Technology (ICT) which allows easy access to information in a convenient form, the traditional methods of accessing library services are being altered. Academic libraries are changing their methods of service delivery; they are experimenting with mobile devices and providing services to support the information needs of their users irrespective of time or distance. This paper presents findings from a study undertaken to examine the prospects for the application of mobile technologies at the University of Jos library, Nigeria.***

Keywords— mobile technologies, academic library services, Nigeria

1. INTRODUCTION

This study examines the use of mobile technology in providing efficient library services in academic libraries in Nigeria. It investigates student's use of mobile devices and the prospects it provides for efficient access to library services and resources at the University of Jos Library, Nigeria. The paper expands further on our earlier exploratory study[1] which discussed current trends in technological applications and how they are changing academic library services in Nigeria. Based on the recommendations of that study, this paper provides current data on the prospects for the use and application of mobile technologies to library services and the expectation of users as to the role librarians can play in supporting its implementation, particularly at the University of Jos. It is anticipated that the findings from this study would be helpful in informing policy decisions aimed at reviewing and formulating new guidelines for user education programmes at the institution.

Mobile technologies refer to handheld devices which can be accessed through a mobile device ranging from a cellular phone to an iPod Touch. Mobile technologies are distinguishable by their small size and portability, their portable nature and communication options provide easy access to the Internet from a single device[2]. The invention of mobile phones such as smart phones, tablets, iPads, iPhones, e-book readers and netbooks which have advanced computing abilities, complete operating systems and Internet connectivity has enabled seamless access to information irrespective of time or distance. Access to information from mobile devices are often determined by the desire for quick and often context-specific information such as e-mails, weather report, banking, video chat, local news, sports news and social networks like Facebook and Twitter[3]. The proportion of users, who never or infrequently use the desktop web, relying solely on mobile access, is growing. This is true of developed countries such as the United Kingdom and the United States, as well as in developing countries[4].In Nigeria, the increasing availability of mobile devices and convenient access to information has thus meant an explosion in mobile internet use. Recent statistics has indicated that as of May 2013, a total of 69 out of every 100 Nigerian own a mobile phone and a total of 114,000,000 mobile phones are actively in use in Nigeria out of a population of about 165,200,000[5].These statistics suggest that with advancements in technology and the rise in smartphone use, people are taking advantage of being connected to information at every point of their lives[6].

2. MOBILE TECHNOLOGIES IN HIGHER EDUCATION

With the potential they provide for more versatile learning experiences and information services, mobile devices are becoming part of many aspects of Higher Education Institutions (HEIs). Some universities have been able to adopt mobile technologies for administering some of their courses through podcasts and other mobile-friendly course materials. Other commercial course management systems such as Blackboard have designed educational tools to aid student learning through mobile applications[7]. Mobile technologies are thus creating a lot of opportunities and the potential to improve and facilitate learning among a growing community of students in HEIs. The challenge therefore, is for HEIs to respond to the constant changes in technology by exploiting the opportunities provided by these technological innovations and work towards making learning more accessible and flexible for students.

Within the context of these changes in HEIs, academic libraries are also exploring various avenues to deliver their services through mobile phones. Specifically, libraries are seeking ways to provide options to information sources and develop the needed skills to deliver enhanced user services. Libraries are harnessing the power of these technologies by incorporating them into library services such as information resources, orientation, circulation, reference services, user instruction and marketing. They are utilizing a variety of technological applications like Quick Response (QR) codes, Instant Messaging and others to move traditional services to the digital age[8]. Among the new methods for the delivery of library services through mobile devices include simple text message alerts for such services as renewal/reservation of books, announcement of new arrivals of resources in various subject disciplines, information on full access to eBooks and journal articles through library's subscriptions, and so on. Academic libraries are also creating mobile versions of their websites for such services; usually, the most common Web 2.0 tools that are could be presented on the library websites are: Facebook,blogs, wikis, Research Site Summary (RSS), and Twitter. Stephens[9] describes Web 2.0 features as a tool that is forcing library professionals to integrate new technologies to offer more efficient library services.

3. LITERATURE REVIEW

A number of studies have explored the implementation of mobile technologies within academic libraries. Aharony's[10] study investigated students' perception of mobile technologies and the level of its acceptance by academic libraries for library services in Israel. The study employed the Technology Acceptance Model (TAM). From the findings of the study, the author noted that students had a more favourable attitude towards the use of mobile technology and appreciated mobile services from the library while the attitude shown by librarians indicated that more exposure, as to the advantages and uses of mobile technology in library services, is needed for them to adapt to changing technological innovations.

Mills[11] in her study on "The Information Use on the Move project" sought to identify trends in the way people interact with information using mobile phones. The project which explored two academic libraries in the United Kingdom namely, Cambridge University and the Open University (OU) was aimed at developing better strategies for academic library services through mobile devices. From the findings, Mills suggested that the increasing dependence on mobile technology by library patrons indicates that academic libraries could exploit the potentials of adopting mobile technologies in such areas as reference service, mobile Online Public Access Catalogue (OPAC) service interface, text alert services and audio tours of the library for more efficient service delivery.

Seeholzer and Salem[12] conducted a focus group study of the mobile web and the academic library at Kent University. The purpose of the study was to investigate students' perceptions of mobile academic library websites and to determine how much time students were using the web on their mobile devices, which features of the library they were using on these devices, and other services they would be interested in having from the library. Outcomes from the study indicated that some of the students used their mobile web access for popular websites like Facebook, Twitter and e-mail while others stated that they used their mobile devices to access resources from the library especially to begin a research project.

In Nigeria, Fatoki[13] (2005) in her paper on the "Prospects of GSM Technology for Academic Library Services" examined the emergence of mobile communications and their implications on library services. The paper highlighted the use of mobile technologies in library services in Nigeria and some of the challenges experienced with respect to inadequate infrastructure. She noted from the findings that the general acceptance of mobile technology in Nigeria has great potentials for enhancing the communication and information technology-related services in academic libraries and information centres in Nigeria[14].

Similarly, Iwhiwhu, Ruteyan and Eghwubare[15] explored the prospect of providing library services through mobile phones in Delta State University, Abraka, Nigeria. The main objective of the study was to examine the benefits derived from the use of mobile library operations and to encourage librarians and library users to integrate mobile technology in library operations in the University. Findings from the study revealed the nature of challenges being experienced by the

University such as inadequate telecommunications infrastructure, poor power supply and lack of trained staff which has hindered the library from fully integrating mobile technology to its services. The authors recommended that better collaboration with mobile operators in the country is needed to help improve transmission quality and ensure network connectivity to the University.

The impact of mobile technology is providing the opportunity for academic libraries to transform the nature of their services through various formats and enrich student learning experiences by making it more accessible, flexible and personalised[16].This possibility can be embraced by academic libraries that seek to be strong partners in the teaching and learning process of their institutions[17].

4. RESEARCH QUESTIONS

This paper examines the use and application of mobile technologies to library services at the University of Jos, Nigeria; the following research questions are considered in the study:

1. What are the potentials for providing library services through mobile devices at the University of Jos Library?
2. What are the needs and expectations of users of a mobile version of library services at the University of Jos?

It is anticipated that findings from the study will provide guidance on the creation of the content for a mobile library website at the University of Jos.

5. METHODOLOGY

The method of data collection for the study involved the administration of a structured questionnaire to selected students of the University which constituted the study population of the research. The simple random sampling technique was employed in selecting the study population[18]. A total of one hundred and twenty (120) questionnaires were distributed to students who were reading in the Main library and two other branches of the University library namely, Naraguta Campus library and the Law library. A total of fifty (50) questionnaires were distributed to students in the Main library out of which 49 were completed and returned. Forty (40) questionnaires were distributed to the Permanent Site library, forty (40) were completed and returned while thirty (30) questionnaires were administered and 26 were completed and returned from the Law library. A total of one hundred and fifteen (115) were completed and returned from the students.

5.1 Data Presentation and Analysis

The analysis and discussion of findings from the study provides an overview of the issues outlined in the research questions.The data as presented consists of the findings obtained from the questionnaire administered to the students in the various libraries. The format of the research instrument which contained various sections was used as a guideline for analysing the data. In explaining the data, a descriptive approach was employed by which themes and patterns that emerged from the data were used to address the research questions[i]. In analysing the data, the statistical software package SPSS was used for the quantitative data after a process of cleaning and coding by assigning numerical values to each batch of data. The data is presented using tables; in the presentation, percentages were rounded to one decimal place for easy comprehension.
Section one of the questionnaire consists of the demographic information of the respondents. **Tables 1 and 2** below provide information on the demographic characteristics of the students in terms of their gender and age group.

Table 1: Gender of Students

Gender	*N=115*	*Percentage (%)*
Male	75	65
Female	38	33
No response	2	2
Total	115	100

Data in **table 1** above shows the gender distribution of the students as constituting a higher percentage of males (65%) than females (33%) while **table 2** below shows that a higher percentage of the respondents (60%) were within the age group of 20-25 followed by 25-29 (19%) and 30 and above (11%). Ninety four percent (94%) of the students were undergraduates while 6% were postgraduate students of the institution.

Table 2: Age distribution of students

Age groups	***N=115***	***Percentage (%)***
18-19	9	8
20-25	69	60
25-29	22	19
30 and above	13	11
No response	2	2
Total	115	100

The various Faculties to which the students were registered is shown in **table 3** below; the highest response is from the Faculty of Law (23%), followed by Natural Sciences (17%) and Medical and Social Sciences, 16% respectively. The lowest response rate was from the Faculties of Management Sciences (4%), Environmental Sciences (3%) and Education (4%) while 4% did not indicate their faculties. The importance of this data is that it reflects the nine Faculties of the University thereby providing valuable insights on the students' views from each of the Faculties represented

Table 3: Faculty of students

Faculties	***N=115***	***Percentage (%)***
Arts	12	10
Education	4	3
Environmental Sciences	3	3
Law	26	23
Management Sciences	4	4
Natural Sciences	20	17
Pharmaceutical Sciences	6	5
Social Sciences	18	16
No response	4	3
Total	115	100

In section two of the research instrument, the data sought to investigate aspects with relation to the use of mobile technology and its relevance for research purposes in the academic environment. The purpose of these set of questions is that responses will inform future directions in incorporating mobile library services that will meet the research needs of students in the institution.

Responses to the question which required the students to indicate if they have a mobile phone shows that 100% of the students owned a mobile phone with 96% indicating that their phones have Internet connectivity

Table 4: Mobile phone ownership

	N=115	***Percentage (%)***
Yes	115	100
No	0	0
No response	0	0
Total	115	100

Further investigations as to the types of phone owned by the students in **table 5** below shows that 39% own a Blackberry, 26% own Android phones, 17% own iPhones while 13% indicated that they owned an iPod Touch device, 4% indicated that they owned other kinds of phones with lower computing abilities.

Table 5: Types of phones owned by students

Types of phone	***N=115***	***Percentage (%)***
iPhone	20	17
iPod Touch devices	15	13
Blackberry	45	39
Android	30	27
Others specify	5	4
Total	115	100

Further outcomes from the data also indicated that 29% of the students have owned these phones for less than a year, 26% between 6 to 12 months and 24% have had it for more than 2 years. Fifty seven percent (57%) also indicated that they are constantly in use of their mobile device for more than 10 times in a week.

Knowledge of the particular types of mobile devices owned by library patrons and the degree to which they are web-enabled informs the nature of the design of mobile library services. Smartphones such as Blackberry, iPhone, Android and so on offer high-tech computing capabilities in addition to conventional mobile phone functions. The popularity of such phones (known as "3G or third generation mobile technology") has grown because of their ability for high-speed broadband access to data services which provide users a higher level of interaction and browser experience through their numerous functionalities[ii]. What is evident from this finding is that more than 60% of the students at the University of Jos regularly use web-enabled mobile devices to access information suggesting therefore that library services at the University of Jos can take full advantage of this opportunity to develop a mobile library website.

In the data below, the various activities to which these phones are put to use are revealed in **table 6** below. In the question, respondents were asked to tick more than one option. Responses show that 44% of the students make use of their phones for such basic operations as making and receiving calls, 27% use it for sending text messages and 25% for listening to music and social media activities such as Facebook and Twitter respectively.

Table 6: Mobile phone use

N=115	*Yes*	*No*
Make and receive calls	51 (44%)	64 (56%)
Send text messages	27 (23%)	88 (77%)
Take / view photographs	16 (14%)	99 (86%)
Watch videos	8 (7%)	107 (93%)
Listen to music	29 (25%)	86 (75%)
Social media – Facebook, Twitter, etc	29 (25%)	86 (75%)
Others	38 (33%)	77 (67%)

For purposes of academics however, data in **table 7** below reveals that 72% of the students indicated that they use their mobile phones for finding online information, 25% stated that they used it for accessing the University and library websites, 23% for accessing email and 7% for completing course work.

Table 7: Mobile phone use for academics

N=115	*Yes*	*No*
Finding online information	83 (72%)	32 (28%)
Accessing email	27 (23%)	88 (77%)
Accessing campus or library websites	29 (25%)	86 (75%)
Completing coursework	8 (7%)	107 (93%)

Survey results from **tables 6 and 7** provide a better understanding of user information behaviour within the mobile context and how this can be used to integrate library services through mobile technologies at the University of Jos.

Some of the challenges identified by the students in using their mobile phones for academic research (in **table 8** below) included such problems as slow download time (56%), small size screens (30%) and difficulty in reading content (8%).Paterson and Low[21] point out that the memory sizes of some mobile devices are accountable for such challenges and suggest the need for a service where students can bookmark items of interest or e-mail a number of information resources to themselves for reference purposes.

Table 8: Problem with mobile phone use

N=115	*Yes*	*No*
Small size screens	34 (30%)	81 (70%)
Slow download time	64 (56%)	51 (44%)
Difficulty in reading content	9 (8%)	106 (92%)
Poor web page formatting	8 (7%)	107 (93%)

Section 3 of the research questionnaire investigated the use of mobile technology in library services, data from the findings are presented below.

Responses to the question which required the students to indicate if they thought that adopting mobile technology to library operations will improve library services reveals that 93% believed that mobile technology will help provide more efficient delivery of library services; 4% did not agree to this view while 3% did not respond.

In investigating the preferred type of library services through mobile devices, respondents were requested to select from the outlined options in the questionnaire. Results indicated in **table 9** below that 59% of the students would want text alerts on new e-resources, receiving text alerts for new items (54%), text alerts for renewal/overdue books (26%) and 4% wanted SMS (Short Message Service) reference services sent to their mobile phones.

Table 9: Preferred types of library services through mobile phone

N=115	*Yes*	*No*
Receiving text alerts for new items	62 (54%)	53 (46%)
Text alerts for renewal / overdue books	30 (26%)	85 (74%)
Text alerts on new e-resources	68 (59%)	47 (41%)
Use of SMS reference services	5 (4%)	110 (96%)
Others	1 (1%)	114 (99%)

This data provides a useful source of information for the type of services that could be included for access in the proposed mobile library website of the University of Jos. Follow up on findings to the above responses also sought to inquire from the students (in **table 10** below) which resources and services on the library's website they would find most useful to access on a mobile phone.

Table 10: Access to library services through phone

N=115	*Yes*	*No*
Opening hours	3 (3%)	112 (97%)
Contact information	16 (14%)	99 (86%)
Library Catalogue (OPAC)	23 (20%)	92 (80%)
Borrowing record	10 (9%)	105 (91%)
Reference collection	17 (15%)	98 (85%)
Electronic journal articles	32 (28%)	83 (72%)
Electronic databases	22 (19%)	93 (81%)
Electronic books	59 (51%)	56 (49%)
Study aids / tutorial	44 (38%)	71 (62%)
List of new books / resources in various subject areas	42 (37%)	73 (63%)
Booking library training sessions	13(11%)	102 (89%)
All of the above	13 (11%)	102 (89%)

Responses as shown in **table10** above indicate that access to electronic books (51%) is a major area of interest for the students. This is followed by access to study aids/tutorials (38%), list of new books/resources in various subject areas (37%), electronic journal articles (28%) and electronic databases (19%). The least areas of importance included information on opening hours (3%), library Online Public Access Catalogue (OPAC) 20% and borrowing record, 9%. Outcomes from this question demonstrate specific areas of interest that students prioritise as necessary for their research needs and reveals areas of additional library services for the library to provide for their users.

6. DISCUSSION AND FINDING

The discussion of findings from the study provides an analysis of the issues outlined in the research questions as follows:

1. ***What are the potentials for providing library services through mobile devices at the University of Jos Library?***

This paper has been able to examine current developments for mobile devices and the expectations of academic library services. The increasing proliferation of mobile technologies indicates that academic librarians must develop greater interest in creating mobile-friendly versions of their traditional websites and developing new service initiatives that meet the needs of diverse user populations particularly the "Net Generation" students. For the University of Jos library, even though it does not currently have services designed for mobile devices, findings from the study point to greater opportunities for offering library services in a mobile environment in the near future. A first step would be to develop library content, services, and environments that are aimed at meeting users' learning and research needs in the mobile context. Data obtained from the study provide an understanding of the profile of the user population (Net Generation) of the library which should underpin future plans for developing content and services for mobile services to users.

2. ***What are the needs and expectations of users of a mobile version of library services at the University of Jos?***

Outcomes from the study have revealed additional types of library services expected by students through mobile devices. The role of the academic library in this regard is to embrace the changing nature of student behaviour by providing efficient services through mobile devices[iii]. Based on the findings, data in **tables 9 and 10** indicate types of services that

students find most useful to their learning activities, providing services in these areas that are compatible with mobile devices would therefore go a long way in

- Enhancing ICT related activities through online interaction between students and library staff.
- Encourage easy exchange of information between library staff and patrons.
- Encourage user's awareness of library services and
- Providestudents with a variety of options for their choice of library services.

Partnering with students in the design phase of mobile library websites will therefore ensure efficiency in the implementation of such services.

6.1 Implications of findings

Findings from this study emphasize the need to re-consider the role academic libraries should play in relation to developing mobile content for academic library services[23]. Among other things, the challenges for implementing mobile library services include the need to provide spaces that promote learning, social networking, and collaborative and independent research among students[24]. Secondly, in view of the changing nature of students' behavioural practices in various learning spaces, HEIs in Nigeria would need to review their academic curricula and pedagogical processes for better educational experience in the digital age. Findings also provide the opportunity for academic libraries to influence the process of teaching and learning in higher education through Information Literacy Instruction.

7. CONCLUSION AND RECOMMENDATION

The challenges of globalisation demands that students are empowered with the essential information skills that will enable them function in a knowledge driven economy. Findings from this study have been able to raise some important issues for consideration with respect to mobile technologies and the role that academic libraries can play in accommodating emerging technologies to teaching and learning .The goal of library services in an academic institution is the continual effort to ensure accessibility to resources irrespective of time or distance as well as the development of relevant skills for our students so that they can be able to take the library with them wherever they go!

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