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Editorial

Library is an integral, effective, and paramount partner in the research, training, and dissemination of latest information in an ICT society. Library and information professionals are providing library services to the community of the highest caliber that meet expressed and anticipated needs of users through innovative technological means. Provision of better library services to the users is an essential element of a library. Various studies around the globe have measured the quality of library services using a variety of tools, for example, SERVQUAL and LIBQUAL.

The most emerging trend in nowadays libraries is "Formal External Review of Library (FERL)." Although this concept is not nascent in business enterprises but its formal exposure to libraries is emerging. FERL process is a unique activity starts with the preparation of an extensive self-assessment report which entails many facets of the library operations, sources and services. The external team/committee of veteran professionals and experts are invited periodically for reviewing the report and visiting the library for an evaluation. This review process ends with an appraisal in the form of detailed report of findings and recommendations.

The important TORs of the FERL committee/team may include: to review the strategic plan of the library, to judge past and present performance of the library, to evaluate the roles, structure and functions of library, and to assess any established relationships with external organizations, libraries and professional groups. Not limited to this, the team can review the library staff profile, skills and areas of operations (i.e. lending and document delivery, information services, IL programs, collection development and management, acquisition, cataloguing and classification and IT services). It will be ideal if the team seeks feedback from library users to evaluate the research and teaching goals of the library services in order to finalize the review report.

The FERL process is a regular feature in developed world and most of libraries are improving their services through this activity. Since the libraries of developing world being at their emerging stage are supposed to go through this SWOT process. This will give them a positive, constructive tone of understanding about the strengths, weaknesses, opportunities and threats in all arenas. However, the external review of libraries should be staged in both formal and informal manners, for the latter can reveal what is sometimes not appreciated otherwise.

Transaction Analysis of Academic E-book Usage: The Case of Ebrary

Pervaiz Ahmad[1] and Mark Brogan[2]

Abstract

Purpose: This paper explored the patterns (way and extent) of e-book use in an Australian case study academic and research library.
Design/methodology/approach: Two years' system-generated datasets (log files) of e-book usage on Ebrary platform were analyzed statistically.
Key finding(s): Only a small fraction of e-books was used in two reporting years at the case study academic and research library. Whereas, a major proportion of e-books was never even accessed.
Research limitation(s): This study is limited to one case study institution and one e-book platform.
Practical implication(s): In a subscription model of e-book acquisition libraries pay the subscription price for the whole database regardless of the usage or non-usage. Hence, renewal of subscription decision or selection of appropriate acquisition model should be based on the extent of usage particularly when funding is scarce.
Contribution to knowledge: The findings of the study may be useful for those libraries that have not yet acquired e-books but are planning to do so.

Paper type: Research.
Keywords: E-books; E-book usage; Academic libraries; Ebrary; Edith Cowan University (ECU); Australia.

Introduction and Literature Review

The shift from print to digital format is rapid across the globe. Asunka (2013) asserts that higher education institutions worldwide are transitioning to e-books generally and e-textbooks particularly. Polanka (2011) views electronic books (e-books) in the academic mainstream. According to Reitz (2017), electronic books in libraries took decades to evolve staring from digitization of catalogues, progressed to periodical

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indexes and abstracts, then to serials and large reference works, and finally to books. The main drivers of e-book adoption in academic libraries are distance students, anywhere and anytime access, need for multiple copies and simultaneous users, lack of physical space, lack of staff and time-bound procedures of circulation and shelving, eco-friendliness, as such no physical processing and wear and tear, and ease in acquisition. E-books are available through publishers, vendors, and aggregators against different acquisition models, e.g. subscription, purchase, and short term loan. Acquisition of e-books via aggregator platforms (e.g. Ebook Library, Ebrary, MyiLibrary, Safari, and NetLibrary) is becoming popular day by day. Aggregators provide a variety of e-books on multiple disciplines by different publishers on a single platform.

D'Ambra and Wilson (2012) citing Cox claim that the sale of e-books in Australia has increased by more than 100% between 2008 and 2009 (p. 49). Schmidt (2013) citing Hales asserts that academic libraries' purchase of e-books is increasing at an astonishing rate (p. 1). For example, at the Queensland University of Technology Library, e-book acquisitions accounted for 20% of the monograph budget in 2008 (Stokker & Hallam, 2009) and about 50% in 2010 (Huthwaite, McClintock, Sinnamon, & Sondergeld, 2011). An analysis of the Australian universities' aggregated data collected by the Council of Australian University Librarians (CAUL, 2012) showed a 512.3% increase from 2008 to 2010 in e-book acquisitions, with an increase of 61.9% between 2009 and 2010.

Patron use continues to be one of the most important and tangible factors that prove the usefulness of library resources; producing usage data for e-books that establishes the level and extent of use is of utmost importance (Crosetto, 2011). Wells and Dumbell (2010) citing King assert that "owing to the financial crisis and subsequent financial restraints that were imposed on academic institutions and libraries, analysis of usage statistics for electronic resources has become more important than ever in recent times" (p.1). Although it is a difficult challenge to find and evaluate methods to judge the worth of library resources in situations of volatility, such methods are required to maintain the utility of libraries into the future (Moore, MacCreery, & Marlow, n.d.).

Ebrary (also written as 'ebrary'), a commercial web-based e-book aggregator/supplier owned by ProQuest in 2011, offers online subject packages (subscription), title by title purchase (perpetual archive), and short-term loan (rental) options to libraries for multiple/unlimited

simultaneous users (Ebrary, 2013; ProQuest, n.d.; Schell, 2011). From 2012, Ebrary e-books can also be downloaded for a 7 to 14 days loan for offline use via Adobe Digital Editions software and Ebrary's app for smartphones and tablets. Utilising a different acquisition model, the recording of COUNTER-compliant usage statistics (COUNTER, 2013) by Ebrary is not the same as that of pay-per-view model. Since the Edith Cowan University (ECU) Library has to pay for the whole database renewed annually as per the subscription acquisition model regardless of use/non-use, data capture is less comprehensive.

Ebrary acquires e-books on a variety of disciplines from different publishers and offer them on their single platform. The Ebrary website was showing 84,829 e-book titles on 20 broad subject areas available to ECU community as at 15 September, 2013, listed in Table 1. (http://site.Ebrary.com.ezproxy.ecu.edu.au/lib/ecu/home.action)

Table 1. Ebrary Subject-wise E-book Collection (Titles)

Rank	Subject	Collection (# of titles)	%
1	Social sciences	18,027	21.25
2	Language and literature	11,403	13.44
3	Science	9,186	10.83
4	Philosophy, psychology, religion	8,198	9.66
5	Medicine	6,726	7.93
6	Technology	6,109	7.20
7	History (general) and history of Europe	4,876	5.75
8	History: America	3,862	4.55
9	Political science	3,130	3.69
10	Education	2,792	3.29
11	Geography, anthropology, recreation	2,744	3.23
12	Law	2,392	2.82
13	Music and books on music	1,317	1.55
14	Fine arts	1,195	1.41
15	Agriculture	1,025	1.21
16	Military science	743	0.88
17	Bibliography, library science, information resources (general)	574	0.68
18	Auxiliary sciences of history	337	0.40
19	Naval science	123	0.14
20	General works	70	0.08
	Total	**84,829**	**100**

Each e-book platform (e.g. EBL, Ebrary) has its own method of recording usage statistics. Usage reports also vary according to the acquisition model, for example, pay-per-view or subscription. Lamothe (2013) points to the confusion over the reporting of e-book usage statistics and asserts that "accesses reported for each page of a book viewed can artificially inflate usage. Conversely, reporting an access per book regardless of how many pages have been viewed can have the opposite effect and suppress real usage" (p. 41). Hence, studies that rely upon usage statistics must be treated with caution.

Ebrary's Digital Rights Management (DRM) restrictions

One page at a time (maximum 30% of pages) can be copied by selecting the desired text. Maximum 30% of pages can be printed from any part of an e-book by selecting a print range. A chapter/range (maximum 30% of pages) of an e-book can be downloaded as a standard image-PDF format to view offline using most computers and devices, including the Kindle, without additional software. Bibliographical detail of the e-book along with copyright information is displayed on every page of downloaded/printed chapters. Additional Ebrary alphanumeric code of nearly 40 characters in a watermark style is also displayed at four different places on every page of a downloaded chapter or range. Ebrary interface displays two separate paginations, for example, page 75 (90 of 209).

The entire e-book in a special format can be downloaded to read offline via Adobe Digital Editions for a 7 to 14 days loan with automatic expiry. A downloaded chapter/range can be printed as per stated limits, but not copied, whereas the entirely downloaded e-book can neither be copied nor printed. Separate user account with Ebrary in addition to institutional one is required to use download and some customization features.

Purpose of the Study

This paper describes the transaction record of Ebrary (one of the aggregator platforms) e-book titles at the Edith Cowan University (ECU), Western Australia to know the way and extent of usage.

Research Methodology

Edith Cowan University (ECU) Library subscribed to the Ebrary online e-book database from 2011 onwards. Ebrary usage statistics for the years, 2011 and 2012, were supplied by the ECU Library for analysis. Data were supplied in different report types and consisted of

brief stats (pages viewed/copied/printed, unique documents, user sessions, and online turnaways), number of monthly searches conducted by users directly with Ebrary platform, and section requests listing unique titles with publishers and most standard numbers used month-wise.

E-book usage reports are automatically, system-generated log files in spreadsheet (Excel) format programmed and maintained by the e-book suppliers. These transaction log files, especially section requests, were analyzed statistically, describing the extent and way of use of Ebrary e-book titles at the case study institution.

Findings of the Study

Patterns of usage: Aggregate trends

ECU's annual report for 2012 reports its population (faculty, students, and general staff) as 25,734 and 25,404 respectively for 2011 and 2012 (Edith Cowan University, 2013). The Ebrary e-book title collection according to Ebrary press releases was over 70,000 and 75,000 respectively in the census months of June 2011 and 2012 (Ebrary, 2011, 2012). Table 2 provides an aggregate trend of Ebrary e-book utilisation at ECU in two years, 2011 and 2012.

Table 2. Ebrary Overall Use Statistics 2011-2012

Parameter	**2011**	**2012**	**% change**
ECU population	25,734	25,404	-1.28
Ebrary collection (# of unique titles)	70,000	75,000	7.14
Collection by # of publishers	379	491	29.55
Unique titles used	10,769	15,975	48.34
User sessions	33,874	56,354	66.36
User searches	14,249	19,888	39.57
Section requests	557,711	804,926	44.33
Pages viewed	521,314	767,456	47.22
Pages copied	6,880	4,853	-29.46
Pages printed	29,517	32,617	10.50
Chapter/range downloads	N/A	2,475	N/A
Full title downloads	N/A	1,757	N/A
Wait queues/turnaways	N/A	N/A	N/A

As shown in Table 2 an increase is recorded in every variable of Ebrary usage except page copying with 29.46% decrease between 2011 and 2012. Table 1 shows good coincidence between Ebrary subject areas

and the teaching and learning programmes offered by ECU with the exceptions of military and naval science. According to Table 2 the used titles were respectively 0.42 and 0.63 per person in the reported years. Since Ebrary does not record user IDs the number of ECU e-book users on this platform cannot be determined.

ECU academic cycle and user section requests

The use of e-books is linked with ECU academic cycles as evidenced in Table 5 and Figure 1.

Table 5. Month-wise Ebrary Section Requests 2011-2012

Month	Section requests 2011	% of total requests 2011	Section requests 2012	% of total requests 2012	% change, 2011-12
JAN	4	0.001	12,039	1.496	300,875
FEB	6,560	1.176	21,742	2.701	231.43
MAR	68,842	12.344	116,446	14.467	69.15
APR	77,232	13.848	121,759	15.127	57.65
MAY	103,386	18.538	105,614	13.121	2.16
JUN	29,269	5.248	29,641	3.682	1.27
JUL	12,221	2.191	20,795	2.583	70.16
AUG	59,750	10.713	98,888	12.285	65.50
SEP	86,904	15.582	127,041	15.783	46.19
OCT	72,330	12.969	101,820	12.650	40.77
NOV	31,680	5.680	32,633	4.054	3.01
DEC	9,533	1.709	16,508	2.051	73.17
Total	**557,711**	**100**	**804,926**	**100**	**N/A**

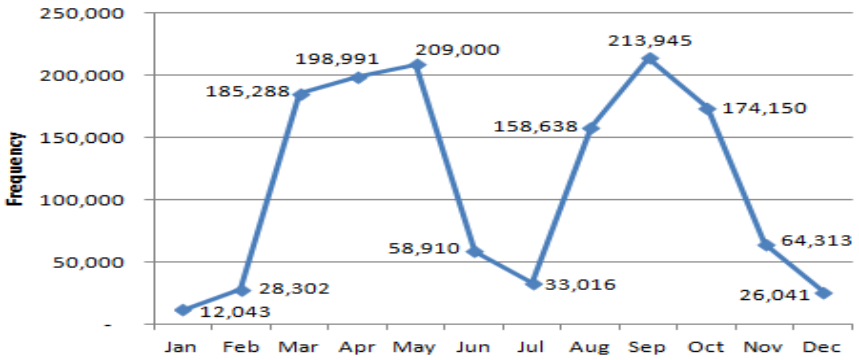

Figure 1. Month-wise user section requests, 2011-2012

May in the first semester and September in the second accounted for most usage followed by April, October, March, and August. These are the months when students prepare and submit their assignments, term papers, and projects. January, February, July, and December are the break months and hence captured comparatively very low usage. Less usage was also seen in the examination months, June and November.

Ebrary e-book titles used

According to Table 2, Ebrary collection (#unique titles) and the titles used increased 7.14% and 48.34% respectively between 2011 and 2012. The ECU community utilised approximately only 15.38% in 2011 and 21.3% in 2012 (average 18.44%) of unique e-books from the Ebrary database. Put differently, 81.56% of Ebrary e-books were never used at ECU in the reported years on average. From among 10,769 titles used in 2011, 2,341 (21.74%) were also used in 2012. In other words, 78% of the titles used in 2011 did not get usage again in 2012. Tables 3 and 4 enlist top 10 most frequently used titles in 2011 and 2012 respectively.

Table 3. Most Frequently Used Ebrary Titles 2011

Rank	Title	Section requests	% of total requests
1	Encyclopedia of elder care: the comprehensive resource on geriatric and social care	5,482	0.98
2	Social psychology	3,088	0.55
3	Discipline with dignity: new challenges, new solutions (3rd edition)	2,620	0.47
4	Teachers and assistants working together: a handbook	2,062	0.37
5	Britannica concise encyclopedia	1,943	0.35
6	Classroom instruction that works: research-based strategies for increasing student achievement	1,940	0.35
7	Perimeter security	1,924	0.35
8	Multiple intelligences: new horizons	1,773	0.32
9	Feminine endings: music, gender, and sexuality	1,717	0.31
10	Strategic human resource management: a guide to action (4th edition)	1,612	0.29
	Total	**24,161**	**4.34**

No definitive conclusion is possible about this behaviour. Changes in reading lists and assessments result in shifts of title use and collection utilisation by subject. However, no data are available about such changes. What is clear, however, is that engagement grew with an increase in titles used by 48.34%.

Ebrary data analysis also showed that the top 10% of the used titles accounted for 60% and 65% (average 62.50%) of usage (section requests) respectively in 2011 and 2012. The trend is even plainer when it comes to the top 20% of titles, where the figures are 77% and 80% respectively. The trend is consistent with some titles having the status of textbooks and/or embedded courseware links. Section requests are calculated as sum of the number of pages viewed/copied/printed, pdf chapter/range and/or full-document downloads. Most variables of Ebrary usage reports are not comprehensive, for example, a unique title used might comprise only a single page view of ten seconds. A page printed/copied might comprise only one sentence or one or fewer lines of a page. Ebrary log files yield fewer insights due to limitations of the nature and extent of data collection.

Table 4. Most Frequently Used Ebrary Titles 2012

Rank	Title	Section requests	% of total requests
1	Britannica concise encyclopedia	10,942	1.36
2	Social work skills: a practice handbook	8,405	1.04
3	Dictionary of human geography (5th edition)	8,269	1.03
4	Why the humanities matter: a commonsense approach	5,298	0.66
5	When chicken soup isn't enough: stories of nurses standing up for themselves, their patients, and their profession	5,188	0.65
6	Humanism	4,399	0.55
7	Historical performance of music: an introduction	4,118	0.51
8	Psychology of food choice (frontiers in nutritional sciences, volume 3)	3,665	0.46
9	Medicines: the comprehensive guide (6th ed.)	3,296	0.41
10	Uprootings/regroundings: questions of home and migration	3,218	0.40
	Total	**56,798**	**7.07**

Subject-wise usage

Tables 6 and 7 list most frequent subjects year-wise. Based on section requests, 211 and 276 Ebrary titles with 400 or more section requests were selected respectively from 2011 and 2012 usage reports.

Table 6. Subject-wise Ebrary Usage 2011

Rank	Subject	Section requests	% of total requests
1	Medicine & Health	29,318	5.26
2	Education	25,384	4.56
3	Social Sciences*	21,884	3.92
4	Psychology	21,003	3.77
5	Business & Management	13,526	2.43
6	Computing	6,826	1.22
7	Engineering & Technology	5,464	0.98
8	Political Science	5,278	0.95
9	History	4,055	0.73
10	Geography & Travel	3,554	0.64
11	Music	3,533	0.63
12	Philosophy	2,949	0.53
13	General	2,413	0.43
14	Language & Literature	2,309	0.41
15	Economics	2,154	0.39
16	Arts	1,736	0.31
Total		**151,386**	**27.16**

*DDC22 (301-307, 360-369) (Dewey, 2003)

These titles were assigned broader subjects using LCSH and descriptors from Google e-books. According to Tables 6 and 7 ranked on the basis of 1,000 or more section requests, sixteen (16) and 21 subjects accounted for 27.16% and 32.4% of usage (section requests) respectively in 2011 and 2012 with medicine & health, education, psychology, and social sciences being the most frequent. Most other subjects in both the years were same except environmental science in 2011 and agriculture, law, media, and physics in 2012. The usage percentage of these subjects would be much more if all the viewed titles are analyzed subject-wise. However, the usage reports provided to researcher did not list subject headings, keywords or Dewey numbers.

Table 7. Subject-wise Ebrary Usage 2012

Rank	Subject	Section requests	% of total requests
1	Social Sciences*	55,069	6.84
2	Medicine & Health	46,383	5.76
3	Education	32,245	4.01
4	Psychology	18,330	2.28
5	General	15,859	1.97
6	Computing	13,258	1.65
7	Business & Management	12,925	1.61
8	Language & Literature	10,518	1.31
9	History	8,608	1.07
10	Political Science	8,405	1.04
11	Economics	7,249	0.90
12	Philosophy	6,157	0.77
13	Music	4,825	0.60
14	Biology	4,113	0.51
15	Engineering & Technology	3,625	0.45
16	Agriculture	3,350	0.42
17	Arts	3,085	0.39
18	Geography & Travel	2,197	0.27
19	Media	1,572	0.20
20	Physics	1,420	0.18
21	Law	1,327	0.17
Total		**260,520**	**32.4**

*DDC22 (301-307, 360-369) (Dewey, 2003)

Publisher analysis

The e-books used in 2011 and 2012 respectively belonged to 379 and 491 publishers. The most frequent 12 publishers each were selected from both the years. These publishers accounted usage for more than 36% of titles and 43% of section requests on average in two reported years (see Tables 8 and 9). In both the years, nine (09) publishers were same and three each were different.

In a nutshell, 28 unique publishers made a lion's share in both the years in terms of number of titles and their section requests. McGraw-Hill, Routledge, Wiley, and Oxford University Press were the most frequent.

Table 8. Publishers Analysis at Ebrary 2011

Rank	Publisher	# of titles used	% of total titles used	Section requests	% of all requests
1	McGraw-Hill	847	7.87	62,424	11.19
2	Routledge	758	7.04	49,356	8.85
3	Oxford University	565	5.25	26,519	4.76
4	Wiley	302	2.80	19,720	3.54
5	Jessica Kingsley	306	2.84	19,125	3.43
6	Open University	150	1.39	16,075	2.89
7	Springer	130	1.21	14,349	2.58
8	Cambridge University	358	3.32	13,091	2.35
9	Ashgate	266	2.47	13,400	2.40
10	ASCD	113	1.05	12,443	2.23
11	John Wiley & Sons	156	1.45	11,049	1.98
12	Sage	129	1.20	10,304	1.85
Total		**4080**	**37.89**	**267,855**	**48.05**

Table 9. Publishers Analysis at Ebrary 2012

Rank	Publisher	# of titles used	% of total titles used	Section requests	% of all requests
1	Wiley	689	4.31	51,580	6.41
2	Routledge	810	5.07	51,398	6.39
3	McGraw-Hill	243	1.52	33,888	4.21
4	Open University	219	1.37	33,425	4.15
5	Oxford University	858	5.37	32,491	4.04
6	Cambridge University	409	2.56	20,247	2.52
7	Jessica Kingsley	405	2.54	20,123	2.5
8	Ashgate	506	3.17	18,160	2.26
9	Continuum International	423	2.65	17,457	2.17
10	Global Media	349	2.19	16,988	2.11
11	Springer	209	1.31	12,528	1.56
12	National Academies	398	2.49	11,992	1.49
Total		**5518**	**34.55**	**320,277**	**39.81**

Other metrics

Searches via the Ebrary interface/site increased 39.57% in 2012 relative to 2011, consistent with the increase in titles used (48.34%), section requests (44.33%), and sessions (66.36%). On average per session 3.37 titles were used, 14.28 pages were viewed, and 15.10 section requests were made in each of the reported years. The searches for e-books via the Library interface were unavailable to researcher and, thus, not included in this study.

The pages viewed in the two surveyed years averaged 1,288,770, with approximately 48 pages per unique title used (N = 26,744). Pages copied in the two reported years averaged 11,733, representing less than 1% of the pages viewed. Copying pages decreased 29.46% in 2012 owing to the introduction of chapter/range downloads and full title downloads, subject to a 7 to 14 days DRM loan expiration restriction. Owing to complications of page copying, page printing increased 10.50% in 2012. In total 62,134 pages were printed in two years, 4.82% of the pages viewed. Chapters/ranges (2,475) and entire e-books (1,757) were downloaded in 2012 when new DRM loan options became available. Full titles downloaded were 11% of the titles used in 2012.

Discussion and Conclusion

The ECU academic community utilised only 15.38% in 2011 and 21.3% in 2012 (average 18.44%) of e-books from the Ebrary database. Put differently, 84.62% and 78.7% (average 81.56%) of Ebrary e-books were never used at ECU in 2011 and 2012, respectively. Twenty-two percent (22%) of the used titles in 2011 received usage again in 2012. The top 20% of the used titles accounted for 77% and 80% (average 78.5%) of usage (section requests) in 2011 and 2012, respectively. The most frequent subject areas included health and medicine, social sciences, and education. This result also is consistent with embedded courseware links as an independent and controlling variable and how academic adoption of e-book texts fundamentally shapes behaviour. The use of Ebrary e-books is linked with ECU academic calendar; May in the first semester and September in the second accounted for most usage followed by April, October, March, and August. These are the months when students study and prepare and submit their assignments, term papers, and projects. Low and lowest usage was observed in exam months, June and November, and during semester breaks, respectively.

An increase in 2012 from 2011 was recorded in different use metrics, for example, searches (39.57%), titles used (48.34%), section requests (44.33%), and sessions (66.36%). On average per session 3.37 titles were

used, 14.28 pages viewed, and 15.10 section requests made in each of two years, 2011 and 2012. Not the entire e-book but only 48 pages per unique title used were viewed in each of two reported years on average. Pages copied in two years were merely 0.91% of the pages viewed. Page copying decreased 29.46% in 2012. Explanation of this decrease includes copy restrictions (maximum 30% of pages) and complications of copying page by page, one page at a time, by selecting the desired text. Contrarily, page printing increased 10.50% in 2012. Pages printed in two years were 4.82% of the pages viewed. Page printing is much easier than page copying owing to option of range selection. Full titles downloaded were 11% of the total titles used in 2012. Figure 2 presents a summary view of Ebrary use at ECU in two years, 2011-2012, across all the variables of interest.

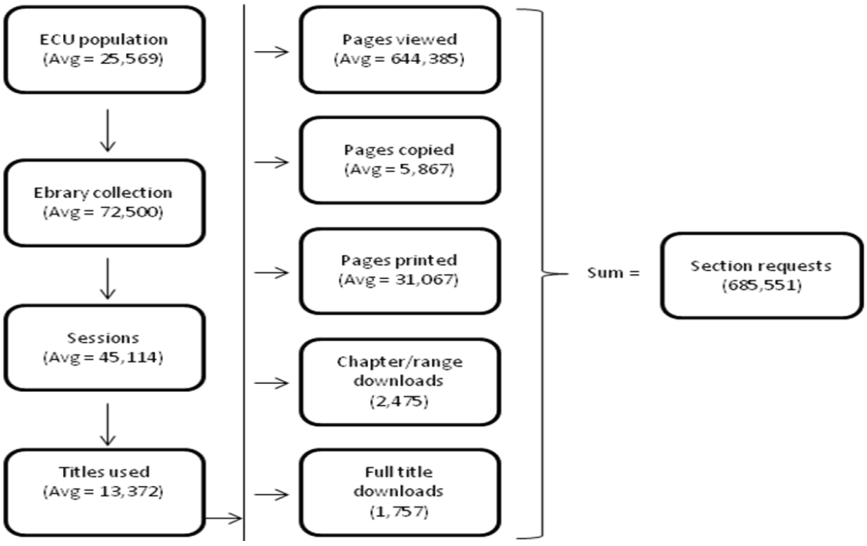

Figure 2. Overall Ebrary e-books use at ECU 2011-2012

The analysis of system-generated dataset explored the patterns of e-book use (way and extent) on Ebrary platform in the case study academic and research library. A pattern of growth was observed with Ebrary, subject to the limitation that log files did not describe browsers, users, and time spent, but only titles used. Increasing engagement of the ECU community was observed with more titles used between 2011 (10,769 titles) and 2012 (15,975 titles) - an increase of 48.34% in the number of titles used. Exploration of titles was disappointing, with only 18.44% of

the Ebrary titles used in the two reported years on average, conforming to Trueswell's 20/80 rule or Juran's Vital Few Principle, sometimes incorrectly referred to as the Pareto Principle (Eldredge, 1998, p. 496). Seventy-eight percent (78%) of the titles used in 2011 did not get usage again in 2012 suggesting that past usage may not be a good predictor of future usage (Bucknell, 2010). A definitive explanation of the lower than expected adoption found in log files is elusive. The contemporary literature showed similar findings, for example, only the 10% of Ebrary titles were used at the Hacettepe University, Turkey (Al, Soydal, & Tonta, 2010); a small number of titles accounted for a large percentage of usage annually, and 97% of the Ebrary e-books were never accessed at the McGill University, Canada (Lannon & McKinnon, 2013). Groves (2014) found through student citations that same e-book titles on Google were used more than those from library collections at the University of Sussex. Other findings in this study are also consistent with Ebrary-based previous studies (e.g. Lamothe, 2010; Sprague & Hunter, 2008; Tucker, 2012). According to Zhang and Kudva (2014), e-book adoption may vary by individual demographic, contextual, and situational factors.

Review of the Ebrary's collection list (vide Table 1) showed that programme subjects are well represented in e-book collections by discipline. Possible reasons of non-adoption, therefore, might include:

- Academics choose not to engage students with e-book titles, preferring journals and p-books. The research did not have access to datasets enabling this problem to be investigated further. The key role played by academic referrers in adoption is widely reported in the literature (e.g., Content Complete and OnlyConnect Consultancy, 2009; JISC, 2009; Lin et al., 2010; Rowlands et al., 2007).
- Users are resistant to the format. The major reasons of non-use explored in the peer reviewed literature (e.g., Ashcroft, 2011; Asunka, 2013; Boness, 2009; Borchert et al., 2009; Croft & Davis, 2010; Howard, 2013; McLure & Hoseth, 2012; Rojeski, 2012; Shelburne, 2009; Walton, 2012) comprised lack of awareness, preference for and use of physical books exclusively, issues of findability in the library catalogue, DRM limitations on e-books, unpleasant to use in terms of difficulty in prolonged screen reading and quality of content, login and internet connectivity problems, cumbersome e-book interface, varied platforms and reader devices, and insufficient especially textbook e-titles.

How can apparent underutilisation of the e-book titles be explained? Lamothe (2013) argues that insight comes from comparing the number of searches with use metrics (e.g., number of viewings, titles browsed and titles read). This may be useful to explore information retrieval and collection issues, for example, query efficiency and discovery tool efficiency in terms of precision and recall (Ahmad & Brogan, 2012), and title sufficiency to meet information needs (Shin, 2011); culture of use, for example, where habit/automaticity operates with the results of searches for e-books as it does with a Google results list where most people do not go beyond the first page of a results list; and immaturity of use – longevity of user experience (e.g. years in higher education), and programme context (undergraduate vs. postgraduate) involve different information behaviour. Most of the collection would consequently remain unexplored if most reading behaviour entailed these factors and crossover effects (culture of use/automaticity) resulting in gaps in the volume of use and the number of users.

The study suggests that ARLs face the challenge not only of building engagement, but also shifting behaviour from nascent to mature use. The research-oriented literature suggests that one element of a successful response to this challenge is the capability of dynamically profiling user behavior contained in log files and to offer individualised experience.

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Influence of Demographic Factors on Satisfactory Use of Electronic Libraries in Northern Nigeria Universities

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Abstract

Purpose: The advent of ICT has come to change the role of libraries in terms of provision of information resources and services. This study examines the influence of users' demographic characteristics on satisfaction with the use of e-libraries in Northern Nigeria universities.
Design/methodology/approach: The survey research design was adopted. Eight universities were purposively selected. The study population was 7,028 users, of which 1,406 were randomly sampled. Data collected were analyzed using descriptive and inferential statistics. Four hypotheses were tested using independent t-test and Spearman's rank-order correlation coefficient.
Key finding(s): The study found no significant gender difference in satisfaction with e-libraries; status difference in the satisfaction with e-library; as well as a negative correlation between age and user-satisfaction, and negative correlation between the users' level of study and satisfaction with e-library.
Research limitation(s): This study is limited to purposively selected eight Nigerian universities with student sample only.
Practical implication(s): Though gender, age and status explained user satisfaction with e-libraries, the level of study which was statistically significant appeared to be more significantly related to user satisfaction with e-libraries when all variables were in the model. There is a need for separate orientation programs using females who are specialist in computer and information literacy as trainers.
Contribution to knowledge: It recommended a clear policy to guide the development and integration of e-libraries in the university system.

Paper type: Research.
Keywords: E-library; Universities; Demographics; Nigeria.

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Introduction

The emergence of Information and Communication Technology (ICT), no doubt, is gaining momentum in Nigerian universities. Once students embrace its use, teaching, learning and research activities in the universities become easier (Olusegun & Adesoji, 2017). According to Etim (2006), the rapid pace of development in the field of IT and the emergence of networked information services had prompted a comprehensive review of the library and information science profession. As stated by Mohamed (2007), the use of ICT had become increasingly important in libraries. Thus, there is a clear departure from manual ways of delivering information services and providing information resources in the university libraries nowadays, which university libraries in Nigeria are also embracing.

Accordingly, considerable investments are expended to develop e-libraries in Nigerian universities, leading to the issue of the extent of use and users' satisfaction with these resources. Electronic library (e-library) represents a collection of networked digital information resources and associated technical and managerial infrastructure, most of which offer open access, with a few on subscriptions (Daniel, 2012). Similarly, The Kentuckiana Digital Library (2005) described it as an organized collection of selected digital resources created to support scholarship, research and teaching.

However, studies by Oluwaseye and Abraham (2013), Ojo and Akande (2005), Egberongbe (2011) and Sharma (2009) revealed that practical uses of e-libraries and their resources were not up to the worth in comparison with the investments on these e-resources. It was against this backdrop that the study investigated the influence of demographic characteristics (gender, age, status and level of study) on users' satisfaction with e-libraries in the universities in Northern Nigeria.

Literature Review

A number of studies have been conducted relating to the relationships between demographic variables and technology adoption and acceptance. Of particular interest was that of Olatokun (2009) that there existed a measure of variance in individuals' access and use of ICT due to socio-demographic factors. Factors such as gender, age, income and skills may serve as determinants of their access and use of e-resources. Affirming this assertion, Bimber (2000) in a study of postgraduate students at Fuzhou University, Fujian, People's Republic of China, indicated that the gender gap in Internet accessibility was larger where more intensive web users were concerned. Women are

substantially less likely to be frequent and intense users than their male counterparts. The finding was attributed to a combination of gendered technology embodying male values, content that favored men and socioeconomic differences. Similarly, Ono and Zavodny (2003) also found women to be less frequent and less intense users of the Internet.

Diyaolu, Olufunmilayo, and Ibrahim (2012) investigated the influence of demographic factors on the use of digital library by the postgraduate students in private universities, using Babcock and Covenant universities in Ogun State. From a survey research approach, it was found that there was a significant difference in the level of study of students from both universities in relation to the use of digital resources. Scealy, Phillips and Stevenson (2002) investigated the use of online applications by male and female students at the University of Whiteland College in London, using survey research method. The study found that male students were more likely to use them than their female counterparts for recreational purposes (playing games online, visiting adult-only sites, gambling, accessing news groups, and discussion forums, staying abreast of new developments, and seeking information for personal use), while females were more likely to use them to interact with their families and friends.

Similarly, Okiki and Asiru (2011) examined the factors influencing the use of electronic information sources among postgraduate students in universities in the South-west, Nigeria. The study found that the male used them more than their female counterpart while the Master students were in the majority in their use of e-resources than other categories of postgraduate students. On the influence of age on the e-library usage, Bar-Ilan, Peritz, and Wolman (2003) found that younger members of the teaching and research staff in Israeli universities were the most active users of e-journals. Similarly, Tenopir (2003), in an overview and analysis of recent research studies using the University of Tennessee, Knoxville, as a case study, posited that there was evidence that younger users were most enthusiastic adopters of digital resources than their older counterparts. This was also evident in the empirical studies of Idowu and Adagunodo (2004), which revealed that younger users rely on them more heavily and rate themselves more experts than older users. Most users of digital resources, according to Diyaolu, Okunlaya and Ibrahim (2015) were students at their prime age.

Okiki and Asiru (2011) posited that age correlated with computer and the use of online library resources. The younger generations brought up with computers are bound to be more familiar with the devices more than adults who had no such privileges while growing up. Emiri (2015)

in the study of influence of demographic factors and the use of OPAC of undergraduates in selected university libraries in Southern Nigeria, found age to have a strong relationship with the use of e-resources. The study found that there were significant age differences on the computer task, as measured by older adults, making few correct decisions and taking a longer time to make their decisions than younger adults.

Waldman (2003) believed that age was one variable that correlates with comfort with computers and use of e-resources. Similarly, Quadri (2013) examined the influence of demographic factors on the use of online library resources by undergraduate students and found that there was a significant correlation between age of the undergraduates in both universities and the use of online library resources. It also ascertained that there was a weak correlation between the respondents' religion and use of online library resources.

Owolabi (2013) examined the educational levels of users as factors in using e-libraries. Those with higher education were known to possess a high level of acceptable attitude and disposition in their work culture. In terms of technology usage, which most often could require a medium and sometimes high level of reasoning, only those who were educated could cope with the inherent complexity of the new technology innovation (Ajuwon & Rhine, 2008). This probably justified the findings of Islam (2011) that students with high level and strong educational backgrounds had a broader knowledge of the use of technology and its advantages in gaining scholastic achievement.

Similarly, members of the academic staff were more likely to use e-resources than their non-academic counterparts. Tella, Orim, Ibrahim, and Memudu (2018) found that the majority of the academic staff used e-resources for research, curriculum development and self-educational development. This is probably because they were exposed to the latest innovation that technology offers; they were expected to be more computer literate, making it easy for them to explore the Internet.

Olatokun (2009) and Quadri (2013) found that level of education had the strongest influence on the capability to use a personal computer and computer with Internet services by different categories of people, including students with the respondents having less education, thus being more disadvantaged in using the facilities.

Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance in this study:

1. $H0_{1:}$ There is no significant difference in gender of e-library users in Northern Nigerian universities in term of user-satisfaction.
2. $H0_{2:}$ There is no significant difference in status of e-library users in Northern Nigerian universities in term of user-satisfaction.
3. $H0_{3:}$ There is no significant relationship between the age of e-library users and satisfaction with e-libraries in Northern Nigerian universities.
4. $H0_{4:}$ There is no significant relationship between the users' level of study and satisfaction with e-libraries in universities in northern Nigeria.

Methodology

The survey research design was adopted for this study. Eight universities (seven public, one private) were purposively selected, regardless of geopolitical zones and ownership; comprising four from North-central, two each from North-west and North-east. Although there were 45 universities (federal, state, and private) in Northern Nigeria, only eight had functional e-libraries at the time of the study.

The study population consisted of 7,028 registered e-library users from these university libraries. From this, a sample of 1,406 was drawn using the simple random sampling technique. A questionnaire was the instrument used for the data collection. The data collected was analyzed using descriptive and inferential statistics such as frequencies and percentages for the demographic characteristics, while both the independent t-test and the Spearman rank-order correlation coefficient were used to test the hypotheses.

Results

As presented in Table 1, a total of 1,406 copies of the questionnaire were administered to the respondents out of which 1,166 duly completed and returned. From this number, 951 copies were found usable for the analysis, giving a response rate of 67.6%.

Demographic characteristics of the respondents

Table 2 presents the demographic distribution of the respondents. Out of 951 respondents, 334 (35.1%) were females, while 617 (64.9%) were male. The male respondents were found to be more than their female counterparts. This suggests a clear inequitable gender balance of the respondents across the universities.

Table 1: Distribution of Questionnaire and Return Rate

Sr#	Universities*	Distributed	Returned	Used for analysis
1	ABU	400	306 (76)	263(65.7)
2	AUN, Yola	67	61 (91)	58 (86.6)
3	FU, Lafia	60	55 (91.7)	53 (88)
4	GSU, Gombe	130	119 (91.5)	98 (75.4)
5	NSU, Keffi	102	98 (96.1)	77 (75.4)
6	UMYU	81	76 (93.8)	67 (82.7)
7	UNIJos	366	288 (78.7)	205 (56)
8	UNIlorin	200	163 (81.5)	130 (65)
	Total	**1, 406**	**1,166 (82.9%)**	**951(67.6%)**

*See appendix for full names of universities.

Table 2: Demographic Distribution of Respondents

Gender	**Frequency**	**Percentage**
Female	334	35.1%
Male	617	64.9%
Age		
51 years and above	11	1.1%
41-50 years	113	11.9%
31-40 years	284	29.9%
30 years and below	543	57.1%
Status		
Staff	206	21.7%
Students	745	78.3%
Level		
PhD	28	2.9%
Masters	67	7.0%
600 Level	17	1.8%
500 Level	68	7.2%
400 Level	254	26.7%
300 Level	234	24.6%
200 Level	178	18.7%
100 Level	105	11.0%
Total (each)	**951**	**100%**

The respondents within the age bracket of 30 years and below constitute the highest number, 543 (57.1%) of e-library users in universities in Northern Nigeria. This was followed by the respondents

within the age bracket of 31-40 years constituting 248 (29. 9%). Only 113 respondents (11.9%) and 11 respondents (1.1%), fell between the age bracket of 41-50 and 51 years, respectively.

The students constituted the highest users of e-libraries 745 (78.3%), while the staff constituted the lowest users of e-libraries 206 (21.7%), in these universities.

The 400 level students constituted the highest 254 (26.7%) respondents, followed by 300 level students with 234 (24.6%). Respondents in 100 and 200 levels respectively constituted 105 (11%) and 178 (18.7%). The lowest frequencies were masters 67 (7%) and PhD 28 (2.9%) respondents across the universities.

Result of the hypotheses testing

This presents the results of the four null hypotheses that were formulated and tested at 0.05 level of significance. The Statistical Packages for the Social Sciences (SPSS), version 20 was used for the analysis. The results are as presented below.

$Ho_{1:}$ There is no significant difference in the gender of e-library users in Northern Nigerian universities in term of user-satisfaction.

Group statistics indicated that the e-library in these universities was slightly more engaging in male (n = 614, Mean = 11.94, SD = 3.29) than the female users (n = 337, Mean = 11.70, SD = 3.02). An independent samples t-test indicated that there was no significant gender difference in the satisfaction with e-libraries (t = 1.104, sig = .270). Therefore, the null hypothesis is accepted.

$Ho_{2:}$ There is no significant difference in the status of e-library users in universities in Northern Nigeria in term of user-satisfaction

Group statistics indicated that the e-library was more engaging to students (n = 648, Mean = 12.1, SD = 3.32) than staff (n = 303, Mean = 11.34, SD = 2.9) in the universities in Northern Nigeria. An independent samples t-test indicated that there was a significant status difference in the satisfaction with e-libraries (t = -3.373, sig = .001). Therefore, the null hypothesis is rejected.

$Ho_{3:}$ There is no significant relationship between the age of e-library users and satisfaction with e-libraries in the universities in northern Nigeria.

The Spearman's rank-order correlation indicated a negative significant relationship between age and satisfaction with e-libraries (n = 951, r_s = -.154, sig = .000). Therefore, the null hypothesis is rejected.

Ho_4: There is no significant relationship between the users' level of study and satisfaction with e-libraries in the universities in Northern Nigeria.

The Spearman's rank-order correlation indicated a negative significant relationship between the user's level of study and satisfaction with e-libraries (n = 951, r_s = -.097, sig = .003). Therefore, the null hypothesis is rejected.

Discussion of the Findings

The study found that there was no significant difference in the gender of e-library users and their satisfaction with them. This was also the findings of Olusegun and Adesoji (2017) and Diyaolu, Okunlaya and Ibrahim (2015) whose study revealed that gender had no significant influence on digital resource usage. However, male users expressed more satisfaction with e-libraries than their female counterparts. This finding contradicted that of Enochsson's (2005) that boys had greater interest in technology than girls. Similarly, studies by Rana (2009) and Bailin and Grafstein (2005) showed a high Internet usage in male than in female, who often did not dedicate much time to technological experimentation as compared to their male counterparts. This was attributed to gender role in attending to domestic issues in the family (Owolabi, 2013).

The study found that the there was no significant difference in the status of users and satisfaction with e-libraries in these universities. Thus, students expressed more satisfaction with e-libraries than their staff counterparts. This might be due to the fact that student-users were more compelled by their academic pursuits and were more in population than their staff counterparts. This study affirmed that of Sivathaasan, Murugathas and Chandrasekar (2014) that there was statistically significant mean difference between readers' type such as staff and students in terms of attitude of usage of electronic information resources at the University of Jaffna, Sri Lanka.

There was negative significant correlation between the age and the satisfaction of users of e-libraries. Younger respondents, however, were found to be more comfortable with e-libraries than the older respondents when age variations were in the model. This corroborated that of Owolabi (2013) that the younger age group appears more technology

enthusiast than their older counterparts, who are most often too busy to experiment with new technology innovations. It also corroborated that of Olatokun (2009) which found the youths more capable of using most of the ICT facilities especially in the aspect of surfing the Internet. One account for this could be the fact that the electronic information system was a recent trend, and as such, only the younger segment of the population would have had the benefit of early exposure to them than the older generation.

A negative significant correlation existed between the level of study and satisfaction with e-library; thus contradicting those of Olatokun (2009), Islam (2011) and Quadri (2013) that level of study of users was highly correlated and significantly influential in the use of online library resources. Similarly, Emiri (2015) found that 300-400 level students used online resources more than other levels in the selected universities. The use of e-library, as the study revealed, increases as the users get to the next level. This showed that there were variances in the degree to which sources of information were used by users at different levels of their study.

Therefore, users at a higher level of study used e-libraries because they were more acquainted with it; having spent much longer years in the university. Students of three and four hundred levels used more in e-resources than students of other levels. The undergraduate students who had progressed beyond first year were more likely to mention some other quality criteria such as currency of information, the reliability of the source and the authority of the source, but time saving was important for them as well.

Recommendations

Based on the findings and discussion, the study recommended that:

1. The university authorities should have a clear e-library development policy, taking into consideration the demography of members of the university communities, which will guide the present library practices to ensure a constant delivery of state-of-the-art information services in the library system.
2. Management of university libraries should create conducive environments for access and the use of e-libraries; irrespective of the users' age, level of study, status and gender.
3. Since the findings reveal that the e-library is slightly more used by the male than female counterparts, the university libraries should consider separate orientation programmes. The trainers should be

mostly females, who are specialists in the areas of computer and information literacy.

Conclusion

The study concluded that, though the four demographic variables were significant to the satisfaction of users with the e-libraries in these universities, however, the relative prediction of user-satisfaction differs. Thus, gender, age and status of users were explanatory variables of user-satisfaction with e-libraries. The level of study, which though, was found to be statistically of negative significance appeared to be a little relevant to user satisfaction with e-libraries when all variables were in the model. This indicated that the level of study of users was more significant to satisfaction with e-libraries in these universities than gender, age or status.

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Appendix 1: University Abbreviations

ABU Ahmadu Bello University, Zaria, Kaduna State
AUN American University of Nigeria, Yola, Adamawa State
FU Federal University, Lafia, Nasarawa State
GSU Gombe State University, Gombe State
NSU Nasarawa State University, Keffi, Nasarawa State
UMYU Umaru Musa Yar'adua University, Katsina, Katsina State
UniJos University of Jos, Jos, Plateau State
Unilorin University of Ilorin, Ilorin, Kwara State

Research on Therapeutics at the King Saud bin Abdulaziz University for Health Sciences: A Bibliometric Assessment

Ikram Ul Haq,[1] Khalid Al Fouzan,[2] and Pervaiz Ahmad[3]

Abstract

Purpose: To carry out the bibliometric assessment of research output on 'Therapeutics' by authors affiliated with King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS), its teaching hospital and research centre.

Design/methodology/approach: Articles having MeSH keyword '*Therapeutics'* were retrieved from PubMed, a database of the United States National Library of Medicine, which produced the list of 161 research documents published in 105 different journals from the inception of KSAU-HS to 20th September 2017. Year-wise distribution of research items, segregation of local and international journals, most productive authors, and major area of research had been calculated. The data were analyzed by using Microsoft-Excel 2010.

Key finding(s): The finding of the study reveals that the majority of articles (90%) is written in collaborative efforts. In 125(77%) publications, the principal author belongs to KSAU-HS, its associated hospital and research Centre. Almost half of the research papers (51.55%) have been produced in collaboration with researchers of other universities / hospitals and organizations. More than half (54.03%) of articles are published during January 2014 to December 2016. Research Articles are preferred type of writing and *Medicine* and *Urology* are the favorite area of research. Ninety-eight (60.86%) articles appeared in 68 journals published from two countries; United States (n=38; 36.19%) and United Kingdom (n=30; 28.57%). Arabi found to be the most prolific author with 37 articles. Most of the research (n=77; 47.82%) is done within KSAU-HS, 57 articles (35.40%) are shaped out with international collaborators and 27 articles are written with researchers affiliated by 16 organizations located in Saudi Arabia.

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Research limitation(s): This study is limited to the bibliography produced by PubMed database on 20th September 2017 with MeSH keyword, Therapeutics. The quantity of articles produced by the researchers of KSAU-HS on "*Therapeutics*" may be more than this number.
Practical implication(s): This case study provides an insight of the publication trends in a selected field of study that may (a) be used to take corrective measures, where needed, and (b) motivate other counterparts to initiate the similar research in their field/institution.
Contribution to knowledge: Research output in a university environment is an important gauge to evaluate the productivity of faculty members. This study fills the gap of bibliometric research in a particular field and institution in Saudi Arabia.

Paper type: Research.
Keywords: Therapeutics; Research productivity; Journal/article publication trends; PubMed; Biomedical publications; Saudi Arabia.

Introduction

Kingdom of Saudi Arabia (KSA) has been progressing in different fields of knowledge rapidly. A number of universities and research organizations and their research activities are increasing. The government is giving special attention to medical education and research in KSA. Qualified teaching staffs have been hired from all around the world to teach the medical students and to collaborate with the local scientists in conducting research (Al-Bishri, 2013; Latif, 2015; Meo, Hassan & Usmani, 2013). King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) came into being in 2005, being the first medical university in the Arab World. KSAU-HS is imparting state of the art medical education in different subjects, i.e., medical, dental, pharmacy, public health, medical education, nursing and applied medical technologies. The researchers are producing research work in journals having high impact factor journals (Haq & Al Fouzan, 2017). KSAU-HS has taken following steps to enhance the research activities:

a. Establishing research excellence and promising research centers (KAIMRC)
b. Arranging research methodology training sessions
c. Implementing criteria of measurement and evaluation of scientific medical research
d. Attracting distinguished faculty members, scholars, and, postgraduate students to conduct and publish their research
e. Providing funds for scientific biomedical research
f. Encouraging distinguished research

g. Creating an academic association on different medical disciplines

KSAU-HS's main campus is in Riyadh with two additional campuses in Jeddah and Al-Ahsa. The main campus in Riyadh hosts seven colleges: College of Medicine, College of Dentistry, College of Pharmacy, College of Public Health and Health Informatics, College of Applied Medial Sciences, College of Nursing and the College of Science & Health Professions. Jeddah Campus hosts College of Medicine, College of Nursing, College of Applied Medical Sciences and College of Sciences and Health Professions. Finally, Al-Ahsa Campus hosts College of Applied Medical Sciences, College of Nursing, and College of Sciences and Health Professions. The advanced medical facilities at the teaching hospitals; King Abdulaziz Medical Cities in Riyadh, Jeddah and Al-Ahsa prove to be critical foundations for the successful inception of the university.

PubMed is one of the authentic and widely used medical databases, managed by the National Center for Biotechnology Information at United States National Library of Medicine. This database has indexed 5,633 journals, and it comprises over 26 million citations for biomedical literature (PubMed).

The data on Medical Subject Heading (MeSH) keyword "*Therapeutics*" was collected from PubMed for this paper. Jain (2008, p.1) defines Therapeutics "*the application of knowledge of pharmacology in the prevention and treatment of diseases*". Online version of Encyclopedia Britannica (Rakel, 2017) delineated that "Therapeutic, treatment and care of a patient for the purpose of preventing as well as combating disease or relieving pain or injury. The term originates from the Greek therapeutikos, which means 'inclined to serve.'Therapeutics means serving and caring for the patient, preventing disease as well as managing specific problems, to treat specific symptoms includes the use of medication to relieve pain or treat infection, surgery to remove diseased tissue or replace poorly functioning or nonfunctioning organs, and counseling or psychotherapy to relieve emotional distress.

Studies on bibliometric analysis have been very popular among the Library and Information Science researchers to examine and assess the scientific growth of publications on any particular subject for a specific period by using citation indicators. Its results help the policy makers to identify the weak and strong areas of research, most productive author, and ratio of collaboration etc. The scientific development of any country,

organization or specific subject can be measured through their published research and its impact (Ullah el at, 2016; Baladi & Umedani, 2017). Alan Prichard (1969) originated this expression, earlier known as *statistical bibliography*. He defined it as "*the application of mathematics and statistical methods to books and other media of communication.*"

The aim of this study is to examine the research growth on the subject of "*Therapeutics*" produced by the researchers affiliated with KSAU-HS based upon the data retrieved from PubMed-Index.

Objectives of the study

Following were the objectives of the study:

1. To assess the growth of literature on *Therapeutics* in term of chronological distribution, basis on research design, study the universe and segregation of subjects.
2. To evaluate the journal wise distribution, authorship pattern and most productive authors.
3. To calculate the ratio of local and international collaborative research activities.

Research Methodology and Limitations

This observational, retrospective and quantitative analysis was carried out at College of Dentistry, KSAU-HS during September to November 2017. Research items on the subject of "*Therapeutics*" with the affiliated address "King Saud bin Abdulaziz University for Health Sciences" were searched by using PubMed/Medline database on 20th September 2017. This query produced the citations of 161 research items, all citations were downloaded in comma-separated values (CSV) file format. CSV file allows data to be saved in table structured format. Further, each and every article had been analyzed to accomplish the objectives of the study. The data were analyzed on Spreadsheet of Microsoft Excel -10. The data used in this study were limited to the result of PubMed/Medline database downloaded on 20th September 2017. Research created by KSAU-HS's authors, that didn't publish in PubMed-Index journals, had not been included in this report. There was a probability of getting some papers omitted or missed by this database/report.

Literature Review

Conducting and publishing high quality scientific research is an authoritative module of success, assessment of the research productivity

and a significant scale of the extent of their contributions to updating existing theories and creating new knowledge. Ware and Mabe (2015) revealed in their report that there were 28,100 active scholarly peer-reviewed English-language journals, plus 6450 non-English-language journals which were publishing about 2.5 million articles a year. The number of articles published each year and the number of journals have both grown steadily by about 3.5% (7 and 9 million articles) per year. The largest subject area covered in scientific journals is biomedical related to *Clinical, Pre-Clinical and Health* representing 30% of all journals. An important subset is the 10,900 journals included in Thomson Reuter's Journal Citation Reports database, these collectively publish about 1.5 million articles annually. According to SCImagojr Journal and Country Rank, Saudi Arabia stood on a 50th number with 2402 published documents in 2005. It stands on 32nd position with 19918 published documents in all subjects in 2016 (Saudi Arabia, 2017).

Various bibliometrics studies had been conducted on the published research literature from KSA. A Scientometrics analysis of the pharmaceutical research in KSA during 2001-2010 was carried out on Scopus database results by Alhaider et al. (2015). Total 1386 papers were retrieved for analysis. Most of the research was performed on pharmacology in relation with Cancer, Cardiology and Diabetes. King Saud University discovered to be the most productive organization with 505 papers and Aboul-Enein was the most productive researcher with 85 papers. The international collaboration consisted in 562 papers (40.55%), among them Egypt was on the top followed by USA and India.

Saquib et al (2017) conducted a bibliometric analysis of cardiovascular disease (CVD) research in Saudi Arabia, based on the data retrieved from PubMed database. It produced 548 citations; 295 studies were selected for analysis covering the period of 1986-2015. More than half of the work (54.6%) published during 2006-2015. Selected studies on CVD were sub-divided into 19 types of diseases including the most common types as coronary artery disease (18%), hypertension (16%) and stroke (14%).

Jamjoom (2017) identified the scientific productivity in medical specialties by KSA researchers covering the period from 1996 to 2014, based upon the data retrieved from SCImago Journal and Country Rank (SCR). The paper analyzed 35,406 KSA documents extracted from 6,450 journals. Relative specialization Index of 46 medical specialties was calculated; ophthalmology, medicine (miscellaneous), and pediatrics were found to be three most productive in KSA. Author suggested that KSA researchers should publish their papers in quality journals.

Haq and Al Fouzan (2017) examined 45 research items on oncology produced by the researchers of KSAU-HS, SA during 2007 to 2015. List of articles was obtained from Web of Science database. The majority (91%) of articles was written in joint-authorship, more than half of the research (55%) was created with the collaboration of other universities / hospitals, and Abdul Rahman Jaziah was found to be the most productive author with 20 articles.

Haq and Al Fouzan (2017) calculated the research productivity of KSAU-HS based upon the results browsed from Web of Science database. Analysis of 775 articles published in 346 different journals had been evaluated, 61% work was appearing during 2013 to 2015. Medicine (n=119; 15.35%) was found to be the most preferred area of research followed by Community Medicine (n=68; 8.77%). The author's assessment revealed that in 475 (61.29%) publications, principal investigators belonged to KSAU-HS. The bulk of research (65%) had been created with the collaboration of 194 organizations belonged to 40 countries of the world. The USA was on the top followed by Canada and Pakistan.

Shehatta and Mahmood (2016) measured 88,506 items produced by Saudi Arabian authors from 1980 to 2014, 28% papers were written on medical and health sciences and King Saud University researchers' created 31% articles. Research collaboration with the United States scientists was high (23.31%) followed by Egypt (22.95%). The majority of articles published in two local journals indexed in web of science, *Saudi Medical Journal* and *Annals of Saudi Medicine*.

Latif (2015) reviewed the 1562 biomedical research articles generated by the authors affiliated to Saudi Arabia published during 2008 to 2012. Citations of articles were downloaded from PubMed database. City-wise distribution of articles based on the first author's affiliation revealed that 54.30% articles were published from Riyadh, followed by Jeddah (15.20%). The 41% publications were created by King Saud University's researchers, with 76% as original research articles. However, only one-fourth (25%) of the articles were published in the journals with high impact factor (≥1).

Al-Bishri (2013) evaluated the 1905 articles published during 2010 and 2011 by the Saudi authors in PubMed index journals, 65.3% works created at Riyadh, the majority of articles (n=216; 15.5%) were written on the subject of Community Medicine, followed by Pathology and Medicine, and King Saud University (n=398; 20.89%) found to be the most productive organization. The paper concluded that Saudi Arabia was lagging behind in medical research due to lack of funds, research

skills, publications, issues and suggested practicable recommendations to boost the research culture in KSA.

Meo et al (2013) investigated the extent of research publications of KSA in medical sciences during 1996-2012. The data were collected from Web of Science, Institute of Scientific Information (ISI), Thomson Reuters and SCI-mago/Scopus. A total of 27,246 documents divided into 9 specialties were analyzed, with medicine (16,196 documents) having h-Index 92 was on the top, followed by biochemistry, genetics and molecular biology (5399 documents) and pharmacology, toxicology, pharmaceutics (2210 documents). Review of relevant literature elucidated that *medicine* was the most favorite area of research among medical scientists and King Saud University, being oldest and biggest university in KSA, played a leading role in research activities.

Review of literature revealed that some studies on bibliometric assessment of biomedical literature had been carried out in Saudi Arabia, but no bibliometric study was found on *Therapeutics*. This study is tending to meet this gap.

Findings

Chronological distribution

Table 1 shows that 161 research items retrieved from PubMed comprise this report. Year-wise distribution showed that 2015 was the most productive year (n=33; 20.49%) and during 2006, only two research items were appeared. The Majority of work (n=87; 54.03%) was published during 2014 to 2016. No item related to *therapeutics* was identified during 2007.

Paper type categorization

There were four types of research designs used by the researchers affiliated to KSAU-HS on the targeted subject. Most of the researchers preferred to write *Research Articles* (n=126; 79.04%) followed by *Case Report* (n=16; 9.93%), *Review Article* (n=10; 6.21%) and *Editorial / Comments* and *Letters* (n=9; 5.59%).

Study universe

Study universe of the research was explored. In most of the publications (n=109; 67.70%), the study setting or universe was the institutions/hospitals located in Saudi Arabia. There were 21 (13.04%) studies in which the study universe was named, *multicentre*. Our researchers collaborated in the study universe of the eight countries in

which Canada was on top with 6 publications followed by USA with three publications.

Table 1. Chronological Distribution of Research Items (n = 161)

Year	Number of publications	Percentage	Cumulative percentage
2006	2	1.24%	1.24%
2007	0	0%	1.24%
2008	8	4.96%	6.21%
2009	8	4.96%	11.18%
2010	15	9.31%	20.49%
2011	9	5.59%	26.8%
2012	11	6.83%	32.91%
2013	13	8.07%	40.99%
2014	28	17.39%	58.96%
2015	33	20.49%	78.88%
2016	26	16.14%	95.03%
Sep 2017	8	4.96%	100%

Table 2. Paper Type Categorization (n = 161)

Type of writing	Number of publications	Percentage
Research articles; including 14 clinical trails and 13 comparative studies	126	78.26
Case report	16	9.94
Review articles	10	6.21
Editorial / comments / letters	9	5.59

Table 3. Country Name of Study Universe

Rank	Country name	# of articles	Percentage
1	Saudi Arabia	109	67.70
2	Not mentioned	21	13.04
3	Multicentre	16	9.93
4	Canada	6	3.72
5	USA	3	1.86
6	China; Egypt; Ethiopia; Jordan; Pakistan; Qatar	1 article with each country	

Subject distribution of published items

The research items were divided under 21 subject headings, most of the articles (n=38; 23.60%) were related to Medicine, followed by Urology/Nephrology (n=22; 13.66%) and Oncology (n=16; 9.93%). Sufficient numbers of articles were found on Pharmacology, Dermatology, Health Informatics, Public Health, Anesthesia, Cardiology and Pediatrics. Researchers showed less interest in *Therapeutics* related to Medical Ethics, Nursing, Blood Transfusion, Genetics, Health Policy and Medical Education.

Table 4. Subject Distribution of Published Items

Rank	Subject	Articles	Percentage
1	Medicine	38	23.60
2	Urology / Nephrology	22	13.66
3	Oncology	16	9.93
4	Pharmacology	14	8.69
5	Dermatology	10	6.21
5	Health Informatics	10	6.21
6	Public Health	8	4.96
7	Anesthesia	6	3.72
7	Cardiology	6	3.72
8	Pediatrics	5	3.10
9	Neurology	4	2.48
9	Orthopedic	4	2.48
9	Pathology	4	2.48
10	Biochemistry	3	1.86
10	Gynecology	3	1.86
11	Medical Ethics	2	1.24
11	Nursing	2	1.24
13	Blood Transfusion	1	0.62
13	Genetics	1	0.62
13	Health Policy	1	0.62
13	Medical Education	1	0.62

Journal-wise distribution

Total 161 research items were published in 105 different journals, 24 (14.90%) items published in 5 (4.76%) local journals, whereas 137 (85.10%) items published in 100 international journals. Nine articles published in each, *Saudi Journal of Kidney Diseases and Transplant* (KSA) and *Critical Care Medicine* (USA), followed by eight articles in

each, *Saudi Medical Journal* (KSA) and *Studies in Health Technology and Informatics* (Netherland), 5 articles appeared in *Journal of Infections and Public Health* (USA). There were 85 journals where only one article published by KSAU-HS researchers.

Table 5. List of Most Preferred Journals

S#	Name of journal with country	# of articles published
1	Saudi Journal of Kidney Diseases and Transplant (KSA)	9
2	Critical Care Medicine (USA)	9
3	Saudi Medical Journal (KSA)	8
4	Health Technology and Informatics (Netherland)	8
5	Journal of Infections and Public Health (USA)	5
6	Annals of Saudi Medicine	4
7	Journal of the National Comprehensive Cancer Network (USA)	4

Authorship patterns

Authorship pattern revealed that the majority of the work (n=145; 90.06%) produced by the collaborative efforts, only 16 papers were written by a single author. Minor difference had been recorded in two authors to six authors' contribution. Five authors pattern recorded 19 items (11.80%) followed by two authors and six authors pattern with 18 (11.18%) research items each. In 31 (19.25%) articles, the numbers of authors were more than 10.

Table 7. Authorship Patterns

Authorship pattern	Number of articles	Percentage
Single Author	16	9.93
Two Authors	18	11.18
Three Authors	17	10.55
Four Authors	14	8.69
Five Authors	19	11.80
Six Authors	18	11.18
Seven Authors	8	4.96
Eight Authors	8	4.96
Nine Authors	9	5.59
Ten Authors	3	3.72
More than Ten	31	19.25

Country of journals publication

Publications affiliated country of the journals depicted that 61 (37.88%) research items published in 38 (36.19%) journals that published from USA, 37 (22.98%) items were appearing in 30 United Kingdom's journals. Twenty-four research items were appeared in five journals published from Saudi Arabia which stood on 3rd position, followed by Netherland with 14 publications in 10 journals. It is evident that the researchers are more inclined to submit their research in those journals that published from USA and UK.

Table 6. Publication Country of the Journals

S#	Journal's publication country	Number of journals	Number of articles
1	United States	38	61
2	United Kingdom	30	37
3	Saudi Arabia	5	24
4	Netherland	10	14
5	Germany	6	6
6	Australia	2	3
7	India	3	3
8	Canada	2	2
9	Pakistan	2	2
10	Sudan	1	2
11	Turkey	1	2
12	China	1	1
13	Iran	1	1
14	Italy	1	1
15	Kuwait	1	1
16	New Zealand	1	1
	Total	**105**	**161**

Authors' affiliation

Total 1650 authors (including multiple counts) produced 161 research items, with the average of 10.24 authors per articles, 582 (35.27%) authors belonged to KSAU-HS. Principal authors' affiliation exposed that in 125 (77.63%) items principal author belonged to KSAU-HS, whereas in 36 (22.37%) items the principal authors affiliated with other organizations of the world, Canada was on the top with 13 papers followed by USA with 7 papers. Almost in half of research items, (n=77;

47.82%) all the contributors belonged to KSAU-HS. Eighty-four papers were written with the collaboration of other organizations.

Table 8. Author Affiliation

Description	# of papers
Total Authors	1650
Authors affiliated with KSAU-HS	582
All authors belonged to KSAU-HS	77
Collaborations with other organizations	84
Principals authors affiliated with KSAU-HS	125
Principal authors belonged to the organizations other than KSAU-HS	36

Table 9. First Author's Affiliated Country with Number of Articles

Rank	Country name	# of articles
1	Saudi Arabia	127
2	Canada	13
3	USA	7
4	Pakistan, Germany	2 Articles with each country
5	Australia; Belgium; China; Egypt; Ethiopia; Hungary; Jordan; Lebanon; Qatar; UK	1 Article with each country

Table 10. Most Productive Authors

Rank	Researcher / contributor name	# of published articles
1	Arabi, Y. M.	37 Articles
2	Tamim, H M.	23 Articles
3	Al-Dorzi, H M.	15 Articles
4	Al Sayyari, A A.	11 Articles
5	Hejaili, F. F.	8 Articles
6	Haddad, S.H.; Balkhy, H.H.; Al-Sayyari, A. A.; Al-Khenaizan, S.	7 Articles each
7	Rishu, A.H.; Baharoon, S. A.	6 Articles each
8	Sakkijha, M.H.; Alsaad, K.O.; Al-Jahdali, H.H.; Aldawood, A.S.	5 Articles each
9	7 authors contributed	Four Articles each
10	18 authors contributed	Three Articles each
11	46 authors contributed	Two Articles each
12	234 authors contributed	One Article each

Most productive authors

In the category of the most productive authors, researchers affiliated to KSAU-HS were included for analysis. Arabi found to be the most productive contributor with 37 articles followed by Tamim with 23 and Al-Dorzi with 15. The number of research articles created by these authors could be even more, for this report analyzed PubMed-Index research items with the keyword '*Therapeutics'* only.

Table 11. Collaboration with Local (KSA) Universities / Hospitals

S#	Name of universities/hospitals	Quantity of articles
1	King Faisal Specialist Hospital & Research Centre	06
2	King Abdulaziz University;	03
3	King Saud University	03
4	Drug Policy and Economic Center, Riyadh,	02
5	King Fahad Armed Forces Hospital, Jeddah,	02
6	Al-Faisal University School of Medicine	01
7	Armed Forces Hospitals Southern Region	01
8	Gulf Cooperation Council (GCC) States and WHO Collaborating Center for Infection Prevention and Control, Riyadh,	01
9	Hail University,	01
10	Kanoo Kidney Center, Dammam,	01
11	King Abdulaziz Specialist Hospital, Taif	01
12	King Khalid University	01
13	King Saud Chest Spec Hospital	01
14	Riyadh Military Hospital	01
15	Saudi Food and Drug Authority,	01
16	Um Al-Qura University	01

Collaboration with local universities / hospitals

KSAU-HS authors collaborated in 27 research items with 16 local universities/hospitals; King Faisal Specialist Hospital & Research Centre was on the top with 6 papers, followed by King Abdulaziz University and King Saud University with 3 articles each, Drug Policy and Economic Centre, Riyadh and King Fahad Armed Forces Hospital

Jeddah with two publications each. There were ten organizations, where KSAU-HS researcher collaborated only in one paper each.

Table 12. Collaboration with International Universities / Hospitals

Name of universities / hospitals	**Country**	**#articles**
McMaster University, Hamilton (4), University of British Columbia (4), University of Toronto (4), University of Calgary (2), Laurentian University (1) McGill University (1), Ottawa Hospital Research Institute (1), University of Ottawa (1),University of Western Ontario (1)	Canada	19
Harvard Medical School, Boston (2), Albany Medical College (1), Columbia University Medical Center (1), Georgia State University Atlanta (1), The University of Southern California (1), UCSF San Francisco CA (1), University of Colorado (1), University of Iowa Carver College of Medicine (1), University of Missouri (1), University of Virginia School of Medicine (1), Vanderbilt University (1),	USA	12
American University of Beirut	Lebanon	06
Bahria University Medical and Dental College (1), University of Karachi (1), University of the Punjab (1)	Pakistan	03
Hashemite University (1), Jordan University of Science and Technology, Irbid (1), The University of Jordan, Amman (1)	Jordan	03
The George Institute for Global Health, Sydney (1) University of New England (1)	Australia	02
University Children's Hospital (1) University Medical Center Ulm (1)	Germany	02
Imperial College London	UK	01
Ankara University, Cebeci Hastaneleri, Ankara	Turkey	01
National University Health System	Singapore	01
Hamad Medical Corporation, Doha	Qatar	01
University of Ibadan	Nigeria	01
Eötvös Loránd University, Budapest,	Hungary	01
University of South Africa	Ethiopia	01
Cairo University	Egypt	01
Wenzhou Medical University	China	01
Erasme University Hospital, Université Libre de Bruxelles,	Belgium	01

Collaboration with international universities / hospitals

KSAU-HS authors' collaboration with international researchers had been recorded with higher score than to local universities / hospitals. The result of overseas collaboration showed that KSAU-HS collaborated with the researchers of 40 universities / hospitals who belonged to 17 countries and produced 57 research items on target subject. Half of the collaboration was done with two countries, Canada and USA; 19 research papers were carried out in the joint authorship with the nine organizations in Canada followed by 12 papers with the 11 organizations of the USA. Six publications had been appearing with the American University of Beirut, Lebanon. There were eleven countries, where one research item was created in a joint venture.

Discussion

Bibliometric assessment is significant activity to reveal various features of scholarly communication and scientific publications (Baladi, 2017). Analysis of bibliometric indicators used to highlight the strong and weak areas of publications. The Present study revealed that 161 articles were created by KSAU-HS researchers on *Therapeutics* during the targeted period with almost 13.14 publications per year. Total 1650 authors contributed 161 papers with an average of 10.24 authors per article. Number of publications was increased during last three years. More than half of the papers were produced in collaboration with 16 local and 40 international universities /organizations. It is interesting to note that in 109 articles (67.70%) the study universe was various hospitals, laboratories and organization of Saudi Arabia.

Recommendations

1. Researchers should submit their research in local PubMed-Indexed journals. In the present study, only 24 (14.90%) articles have been published in local journals.
2. Future researchers can replicate this study on the data retrieved from other database e.g., Web of Science, Scopus and Google Scholar.
3. There is a need to conduct more bibliometric studies on different areas of medical sciences to find out the merits and shortcomings at Saudi Arabia.
4. There is need to carry out more research on *therapeutics* in relation to *Pediatrics, Neurology, Orthopedics* and *Gynecology*.

Conclusion

The present study shows that research activities on *Therapeutics* are growing with remarkable pace at KSAU-HS, Saudi Arabia. This kind of bibliometric analysis not only illustrates the encouraging situation, but also motivates the young scientists to conduct innovative and productive research through local and international collaboration. Wellbeing and quality health of the population is the prime objective of medical education, practice and research. This objective cannot be achieved without addressing the current medical problems through problem solving research.

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Mobile Phones and Digital Library Services in Open and Distance Learning

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Abstract

Purpose: The study aims to provide an overview of the concept and history of mobile phones and distance learning, characteristics of digital libraries, and the application of mobile phones in libraries in open and distance learning (ODL).
Design/methodology/approach: A comprehensive literature search was conducted through the National Open University of Nigeria Library and several other databases to identify how mobile phones could be used in accessing digital library services by students in open and distance learning system, and to highlight its benefits and disadvantages.
Key finding(s): Mobile phones have evolved over times and the availability of the internet has necessitated the use of a smartphone, palmtops and android phones by distance learners in accessing library services provided in digital and electronic formats fasterfrom their different locations and at any given time. Digital libraries must find a means of reaching out to the remote users through the use of mobile phones for effective information processing, delivery and retrieval.
Research limitation(s): The study only highlights the concept of mobile phones, characteristics of digital libraries, and application of mobile phones in library services in open and distance learning (ODL) without detailed account on library databases and an evaluation on the application of mobile phones in ODL library services.
Practical implication(s): The study exposes the historyof mobile phones, their uses in the provision and accessibility of library services by distance learners. This will help the distance learners in knowing library services and resources they can access from digital libraries at the comfort of their locations with their mobile phones without visiting the library.
Contribution to knowledge: This study claims to be the pioneer with the perceptive on the application of mobile phones in digital library services in open and distance learning in Nigeria.

Paper type: Review.
Keywords: Mobile phones; Open and distance learning (ODL); Digital libraries.

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Introduction

Rapid advancement in information and communication technologies has promoted the production of mobile devices for communication. Most open and distance learning students need access to library resources and services at home and in their working places. Therefore, it is necessary to design the library resources and services into digital and online format which can be accessed through mobile devices and tools. The most popularly used mobile devices are mobile phones which provide voice services, and transmit data, and text from one user to another.

Mobile phones are ideal tools in libraries in open and distance learning (ODL). They help in bringing library resources and services to learners wherever and whenever they need them. Mobile phones are devices that can receive and make calls using a radio frequency carrier. They use frequencies transmitted by cellular towers to connect calls between two devices. Mobile phones are inevitable tools for information communication in the contemporary society. Mobile phone as wireless handheld device allows users, among other features, to make calls and send text messages. Today's mobile phones are not only for making and receiving calls, and text message, but have included some features such as web browsers, games, camera as well as video players and even navigational systems.

History of mobile phones

The history of mobile phones from 1973 as opined by Goodwin (2015), the first handheld mobile phone was demonstrated in 1973by John F. Mitchell and Martin Cooper of Motorola weighing c.4.4 Ibs (2kg). The first commercial automated cellular network was launched in Japan by Nippon Telegraph and Telephone in 1979. Then in1981 Nordic Mobile Telephone (NMT) system was launched in Denmark, Finland, Norway and Sweden. Other countries followed in the mid of 1980s.The commercially handheld cellular mobile phone- the Motorola Dyna TAC 8000x was launched in 1984. All the first generation system was used for simultaneous calls, but used analog technology (Charny, 2001).

In 1991, the second generation digital cellular technology was launched in Finland by Radiolinja on the Global System for Mobile Communication (GSM)standard. These digital Cellular phones challenged the incumbent network operators because it had advanced mobility and more services. Ten years later in 2001, the third generation mobile phones emerged and was launched in Japan by NTT DoCoMo on the Wideband Code Division Multiple Access (WCDMA) standard, this was followed by 3.59, 3Gt or turbo 3G with enhanced high-speed packet

access and a higher data transfer and capacity (Charny, 2001). The launch of the Iphone in 2007 resulted in smart phone becoming available to the general public. In 2009 it became clear that the 3G Network would be overwhelmed by the growth of bandwidth intensive application. This prompted the industry to look for data optimized fourth-generation technologies, with the promise of speed improvements up to tenfold over existing 3G technologies. The 4G were different from 3G because it eliminated the circuit switching instead of employing an all-IP network. The 4G ushered in the age of local area network (LAN) and wide area network (WAN) via voice over internet protocol (VOLP). The use of mobile phones and computers led to the use of internets (Kumar, 2014).

The internet and mobile resources have revolutionized the ways libraries acquire, process, package, and disseminate information to both on campus and off campus library users. Mobile phones are one aspect of mobile technologies that can be used by libraries to disseminate information to students' especially in open and distance learning institutions from digital libraries.

Digital libraries

Digital libraries provide electronic resources and prints in digital formats and can be accessed through the use of computers and other mobile technologies. The contents of digital libraries can be stored and accessed remotely by library users irrespective of their location through local area network(LAN).According to Trivedi (2010), digital libraries are organizations that provide resources, including the specialized staff, to select, structure, offer intellectual access to interpret, distribute, preserve the integrity of and ensure the persistence overtime of collections of digital works so that they are readily available for use by a defined community or set of communities.

Digital libraries provide users with a very large information and knowledge in the form of images and texts which are produced and accessed through technological devices. Digital library collections are made of scholarly publications which are transformed into digital formats. In this kind of library, a significant proportion of the resources are available in machine-readable format as opposed to print or microforms (Nwokocha& Chimah,2013). This makes the resources easily available to users who have access to computers and the internet.

Characteristics of digital libraries

- Digital libraries as noted by Aina, Mutule and Tiamuyu (2008) exist as virtual that is not as a physical entity.

- Provide remote access to information over computer networks.
- Facilitate immediate and simultaneous access to information.
- They exist as multimedia object in the form of text, video, sound and graphics and animations.
- Can be accessed from anywhere, anytime, subject to restrictions that may be imposed by standards, firewalls and other infrastructures.

These characteristics confirm the content of digital libraries involve the conversion of document from print into electronic formats. This process is known as digitization. This can be achieved through scanning such materials with a scanner and storing them on a computer which can be accessed locally and internationally through the internet. These digital library resources can be stored and accessed through the use of mobile technologies such as, mobile phones, palmtops, laptops and computers. The remote access to resources and services available in digital libraries, anytime and anywhere, plays a vital role in the education of distance learners.

Meaning of open and distance learning (ODL)

Open and distance learning is a way of providing learning opportunities that is characterized by the separation of teacher and learner in time or place, or both. Open and distance learning involves all varieties of learning such as full-time studies, correspondence studies, undergraduate certifications, postgraduate certification, workplace and professional training, and lifelong education (Commonwealth of Learning, 2015).

Open and distance education has developed in two major directions, the individual flexible teaching and extended classroom mode. The individual mode allows students to start the class at any time, study in isolation and communicate with instructors and classmates through asynchronous tools. While the extended classroom model organizes students into groups, requiring them to meet at the local study center and it allows the students to use interactive technologies such as video conferencing ((Rekkedal & Dye, 2007).

The goals of open and distance learning are to provide an alternative learning to traditional education in a formal classroom and on campus education where people can obtain training and certificate at all levels of education to better their living in the society. Open and distance learning is aimed at battling illiteracy in developing countries, providing training for economic growth. According to Al- Faheed (2009), distance education relies heavily on technologies of delivery, print materials,

radio and television broadcasting, computer conferencing, electronic mail, interactive video, satellite telecommunication and multimedia computer technology are all used to promote student teacher interaction and provide necessary feedback to the learner at a distance.

Mobile Phone and digital library

Mobile phones are wireless technologies which allow the transmission of data-text, voice, video or image through radio waves. Mobile phones give users continuous access to network resources without limitation of time and location. Digital libraries came into existence with the developments of technology. Digital libraries have moved outside the physical libraries to give access to library resources and services without limitation of time and location (Al-Fahad, 2009). Digital libraries use these mobile devices because of their fast and easy convergence of information to library users. These digital devices also take the library resources and services to the userswhere they are. Mobile phones serve as new vehicles for information dissemination to various users of the library. Mobile devices used in digital libraries are:

- Cell phones
- IPods/Mps players
- Tablets
- Personal Digital Assistant (PDAs)
- Smart phones
- Blackberry
- Pocket-size computers
- Organizers
- Palmtops

Mobile phones and other mobile devices present a new exciting opportunity for digital library services to all ages. Distance learners no longer need to visit a library to have access to a computer and the internet to access information from digital collection but can experience digital collections through their mobile phone. This means that mobile phone offers tremendous flexibility to thedistance learner who wants to take advantage of library services provided in the digital libraries for information and research needs.

Distance learning library services are library services in support of college, university or other post-secondary courses and programs offered away from main campus, or in the absence of a traditional campus and regardless of where credit is given (ACRL, 2008). According to Hopper

(2010), most common library services offered to distance learners to include "remote online information literacy tutorials; research guides for academic and special interest topics, online library guides, Ask-A Librarian (chat, e-mail, or telephone) inter library loan, electronic reserves, reference services and document delivery service.

Application of mobile phones in digital library services

Digital library services are used in connecting distance learners to the resources available in the library. Librarians have to take advantage of an increasing number of smart phones to disseminate information, market and ensure access to library services provided in digital libraries. The digital library services which students can access through their mobile phones are:

- Library short message system (SMS)
- Mobile Library Databases
- Mobile Audio Library Tours
- Request for Document delivery
- Online access to library catalogue
- Ask-A-Librarian
- Inter-Library Co-operation
- Wi-Fi - Internet Access
- News and Events
- E-mail

Library short message system alert

Digital libraries in open and distance learning institutions can use short message system (SMS) alert services to offer library services to distance learners to solve their information and research needs. The followings are the digital library services that distance learners can access through SMS alerts with their mobile phones:

- Request for reservation of books and information and the availability of reserved documents for collection.
- Acknowledging the distance learner about the renewal of a book.
- To inform distance learners on the existence Online Public Access Catalogue.
- Reminding the users about date due notices and overdue charges.
- Send suggestions to Librarians on library resources needed by users that are not available in the library.
- Sending answers to reference questions to distance learners via SMS.
- Sending alerts on - upcoming events and breaking news.

- Requesting for the opening hours of the library.
- Checking the availability of information resources and renewing of books.

Mobile library databases

Library users can access various resources from the digital libraries databases through their mobile phones. This helps distance learners to access information on electronic resources.

Mobile audio/visual library tours

Digital librarians provide audio tours showing the various sections of the library and their services to users. These services can be viewed and listened to with mobile phones. The library visual and audio tour can be used in teaching during orientation and information literacy programs. They allow distance learners, who may not have time to attend these programs, to download the programs from the library website, listen and participate in the programs with their mobile phones.

Request for document delivery

Distance learners can request for the delivery of some information resource to their homes and workplaces from the library through their mobile phone. The digital library can support the transfer of scanned images and collections to the user's devices.

Online access to library catalogue

The library catalogue is the bibliographic details of all the library holdings. These bibliographical details of prints and non-prints in the library can be accessed through mobile phones when they are online regarded as Online Public Access Catalogue (OPAC). Through the OPACthe learner can use his/her mobile phone to do integrated search. The Online Computer of Library Centre (OCLCs)WorldCat mobile application pilot allows distance learners to search for books and other information sources through a web application using PDA and other smart phones

Ask-a-librarian reference services

Digital library librarians provide reference services to users through their mobile phones using live chat and text messages. The Ask – A – Librarian services allows patrons to submit queries on research to librarians through text messages while librarians provide instant answers and links for further studies.

Inter-library cooperation

The patron using a mobile phone can request for information resources that are available in another library through his/her institutional digital library. The library may notify the patron through SMS alert on the availability of his/her requested resource.

Wi-Fi internet access

The provision of Wi-Fi network in the library allows patrons to access the information online from the library and search for other information from the web through mobile phones. It also allows online chat between patron and the library staff. This can be possible when the patron gets the MAC address (Media Access Control Address) to access the Wi-Fi of the library.

News and events

In digital libraries, distance learners can receive information on scholarly publications, adverts, orientation programs, book call, events, awards, notice of public holidays, breaking news, opening and closing hours of the library through mobile phones.

Electronic mail

E-Mail reference services provide assistance to distance learners. In a digital library reference services,distance learners can submit their questions, and can get answers in their e-mail inbox from the librarian.

Benefits of using mobile phones in digital library services

Applications of mobile telephones in the delivery of library and information services in digital libraries have many advantages. Libraries have used mobile phones in providing many services to patrons. Suzuki in Kakan and Kanyengo (2009) opined that mobile phone delivers new information services to meet the needs of users, enhance user friendliness and receive prompt feedbacks from users. The followings are some of the benefits in using mobile phones with digital library services:

- It is user friendly
- It is used in personalized services like selective dissemination of information and addressing reference queries of users
- Encourages users' participation
- Ensures limitless access to information from the library with their phones from anywhere and anytime.
- It is time saving for patrons and library staff

- Solves the problem of accommodation in the library.

Disadvantages of using mobile phones in digital libraries

Some of the disadvantages of using mobile phones in digital library services include:

- Setting up mobile interface services is very costly.
- The devices can expose valuable data to unauthorized people.
- Students may see the short text message service/chat services as a social interaction rather than a mean of sending and receiving vital and educational information.
- Some students may not like to disclose their personal phone number to the library management for privacy reasons.

Conclusion

Open and distance learning has come to stay, so digital libraries must find a mean of reaching out to the remote users through the use of mobile phones for effective information processing and delivery. In the era of information explosion and the vital need for distance education to eradicate poverty, illiteracy and to improve socioeconomic status of citizens, digital libraries in distance learning environment are faced with more challenges in providing resources and services for these "brick" and "click" institutions. Despite these challenges libraries face, mobile devicesoffer tremendous flexibleservices to those who want to take advantage of library services with a simple 3G (3 generation) connection. Users can access e–books, digital resources and multimedia contents of the institutional digital libraries and other libraries through their easy to use smart gadgets. Some of these challenges could be remedied through provision of effective funding to the digital libraries, lowering of call tariffs by service providers, training of library staff and users on the effective and wise use of mobile phones in processing, storing and accessing information from the digital library websites. Besides this there is a need for ensuring security of the contents of the digital library resources.

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Choice of Librarianship as a Career: A Case Study of FUOYE Pioneer Library and Information Science Students

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Abstract

Purpose: This study determines the factors that shape students' selection of Library and Information Science (LIS) as a discipline/career at the Federal University Oye-Ekiti (FUOYE) in Nigeria.
Design/methodology/approach: This study is based on a questionnaire survey of 82 pioneer students in the Department of Library and Information Science.
Key finding(s): The study revealed that the female respondents, 47 (57.32%), were more (more?), while 54 (65.85%) of the respondents were within the age bracket of 16-20 years. The respondents spread across fifteen states in Nigeria, had their subject background differently in Education 30 (36.59%), Science 21 (25.61%) and Arts 20 (24.39%). Likewise, 23 (28.05%) and 21 (25.61%) respondents got to know about librarianship through their mentors and parents respectively. The study revealed that 46 (56.09%) of the respondents, t chose librarianship through their personal interest, while 22 (26.83%) by chance. The study further showed that 62 (75.61%) of the respondents wished to be lecturers while 64 (78.05%) aspired to be practicing librarians. The 63 (76.83%) of the respondents had no intentions to change their course in the near future, while 65 (79.27%) agreed that they were already determined to study Library and Information Science.
Research limitation(s): The study is limited to the newly admitted (pioneer) 100 (100 level) students of the new Department of Library and Information Science, Faculty of Education, Federal University, Oye-Ekiti, Ekiti State, Nigeria.
Practical implication(s): Librarianship is gaining momentum as more female students in their young age, are showing interest in the profession.
Contribution to knowledge: This study may be used in a comparative context with other developing countries.

Paper type: Research.
Keywords: Librarianship; Library profession; Career choice; Nigeria.

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Introduction

Librarianship, like any other demanding profession, is getting popular in Nigeria. Many of the youth are becoming aware of this profession and they now show interest in making a career in librarianship. Bello (1992) in a related study quoted a respondent who was satisfied with librarianship as a chosen profession as saying that, "as a professional, librarianship in practice produces 'a sound you'. You can never stop reading. Reading becomes part of you, as you wouldn't want to be embarrassed by your clients on current issues, subject wide" (p.3).

History of librarianship in Nigeria

The history of librarianship in Nigeria goes back to the establishment of first library school in Nigeria, which is in the University of Ibadan, Ibadan, Nigeria.

John Harris was widely regarded as "Father of Nigerian Libraries" cited by Busayo (2006). A foundation student viz. Ajayi (1988) at the University College Ibadan from January 1948, who witnessed the arrival of John Harris as the first University Librarian in November 1948, also affirmed it. Ajayi further observed that the Institute of Librarianship, later the Department of Library Studies, which John Harris founded was a full-fledged academic department. Likewise, William John Harris was the only professional staff the library had at its inception in 1948 and that as a result of his outstanding pioneering efforts; the most senior librarians in Nigeria were either trained at Ibadan or worked therein.

The Department of Library, Archival and Information Studies came into existence in 1959 as the Institute of Librarianship at the University of Ibadan, Nigeria. At its inception, the Department started the Diploma program in Librarianship and later on Masters and Doctoral programs were started. It was not until 1990 that the Bachelor's Degree program was introduced. Initially, the nomenclature of the degree was a Bachelor of Library Studies. It was changed to Bachelor of Library and Information Studies (BLIS) in 1995 at the very time when the name of the Department was changed to Department of Library, Archival and Information Studies to reflect the diverse specialties therein (University of Ibadan, 2015).

Librarianship as a professional career

Aina (2004) rightly observed that a library was concerned with the collection, processing, storage and dissemination of recorded information for the purpose of reading, study and consultation. He stressed that the growth and importance of libraries brought about the profession of

librarianship. He equally stated that a librarian was the professional concerned with the collection, storage, processing and dissemination of recorded knowledge in a library.

Ajidahun (2008) also observed that at the tertiary education level, especially at the College, Polytechnic and University levels, the establishment of the tertiary institutions depended heavily on the existence and the quality of their library services. He noted that the University library had come to be accepted as the academic heart, hub and the nerve-centre of the University. Since the University was established for teaching, research and community service, no meaningful teaching and research could take place in the tertiary institutions without the provision of adequate library services.

Oyebade (2010) saw a professional as a well-trained person in the art of performing a job that required a high level of skills and competence.

Objectives of the Study

This study intends to find:

1. Why the students choose FUOYE as their university of choice?
2. How the students get to know about librarianship?
3. What informed the students' decision to choose librarianship?
4. The students' choice between being a practicing librarian or a lecturer in the Department of Library and Information Studies.
5. The genuineness of the choice/decision earlier made by the students.

Literature Review

A number of scholars have written about the choice of librarianship as a career, both within and outside Nigeria. Salaam and Owolabi (2010) in a related study observed that previous work experiences in libraries served as a major reason for the choice of librarianship in Ogun State, Nigeria. The duo discovered that some of their respondents started their career as library assistants or library officers and then decided to remain in librarianship after their secondary school education. While some library personnel claimed that they learned about the profession through friends and relatives.

There are many professions. However, librarianship is no doubt a profession as it meets all the characteristics of a profession as outlined by Nwalo (2000, p. 79) namely:

- A profession is learned since it is based on a substantial body of knowledge

- A profession is guided by altruism or concern for the client who comes for help
- A profession has techniques or skills which can be taught
- A profession is practical since this body of knowledge can be used to solve human problems
- It has a standard of professional qualifications for admission to the professional group, based on character, training and proven competence.
- A profession is based by recognition of status by one's colleagues or by the state as a basis of good standing.
- A profession has an organization of the professional group devoted to its common advancement and its social duty rather than the maintenance of economic monopoly.
- The practitioners of a profession enjoy a relatively high degree of autonomy and should have the ability to exercise independent judgment in problem-solving.
- A profession has an official publication for advancement of knowledge of the profession.
- A profession must be useful to society and its practice should be able to provide adequate means of livelihood for the practitioner.

Many of Nigerian youths, particularly, secondary school leavers, often face a number of challenges in the process of choosing a life career. This may be due to their ignorance or failure to seek appropriate counsel. Indeed, many adolescents do carry these problems into adulthood. Geshinde (1986) noted that making a wrong choice of career portended danger. He stressed its adverse effect on physical health, the company of friends and job security. This view was buttressed by Issa and Nwalo (2008) who claimed that wrong choice of career could lead to frustration and low productivity.

Likewise, Ferry (2006) identified the factors that determine people's occupational choice, to include life context, personal attitude, and educational attainment. Tella (2007) equally observed various factors, such as attractive salary, good condition of service and job security, which could promote librarianship as a choice of career. Agumanu (1989) conducted a similar study on factors that influenced the students in Imo State University Library School. The findings revealed that 80% of the respondents entered the library school because they failed to secure admission into other departments such as law or engineering and

that 20% of the students picked the profession due to the influence of librarians in their family.

Alemna (1991) conducted a study on the postgraduates at the University of Ghana Library School and found that despite the fact that most of the students were there because other options were denied, opportunity for intellectual development and further education were a major reason for choosing the profession as a career. This view also corroborated the findings of Nzotta (1982) on the reasons for the choice of librarianship among the postgraduate students at the University of Ibadan. In his findings, the majority of the respondents (58%) indicated that they chose the profession because it gave them room for intellectual development.

Similarly, Issa and Nwalo (2008) examined the factors affecting the career choice of undergraduates in Nigeria library and information schools. They discovered that 68.86% of the respondents claimed that they chose the profession because of their previous work experiences in a library, while 15.68% admitted that they opted for the profession in order to secure a good job.

Busayo (2006) in a survey of librarianship in Nigeria, opined that people went into the field without realizing exactly what they were heading for, neither were they aware of the status a librarian had in the country. Likewise, they were not aware, what opportunities and prospects were available.

Iwuji (1979) opined that Librarianship had a good record of professional association at all geographic levels. He asserted that both the International Federation of Library Associations (IFLA), the regional and national associations were mainly concerned with the development of standards and techniques of service. Iwuji stressed that much premium was attached to the moral and intellectual quality of the professional man because the public image of the profession was created by the aggregate quality of the consisting practitioners. Moreover, the profession renders vital and specialized social service, which only the best breed of men and women can be trusted to dispense.

Aje (1977) in a lecture delivered on "Career in Librarianship" as the Director of the National Library of Nigeria appealed to the Nigerian youths to embrace librarianship, he said:

> Lastly, my appeal goes to the youths of this country, to include librarianship on their list of careers when considering a choice. It is a new area; the prospects are very good. It is a profession with a good universal currency - The nation needs you now, join in.

The above assertion of Aje in 1977 is still true as at date. Aje as at then also strongly opposed the general misconception that librarianship took a back seat in the public service. He stressed that if an individual took a back seat in relation to his job, it does not typify a whole profession.

A survey conducted by Bello (1992) revealed that many a people do not decide on librarianship from the onset of their life career. The choice of the profession tended to either be as a result of influence, experience or only as an alternative left. Bello quoted Herther as saying that she did not grow up wanting to be a Librarian, so it came as a shock to her family, friends and even herself when she decided on the profession.

Methodology

A structured questionnaire was administered to the pioneer (100 level) students during one of their compulsory courses (lectures), taught by the researcher. Ninety (90) questionnaires in total were distributed for completion by the students, out of which eighty-two (82) were returned duly completed and found useable for this study, representing a return rate of 91%. The respondents were not allowed to take the questionnaires to homes. They were given about 10 minutes to fill and submit before the commencement of their lecture for the day.

Findings of the Study

Demographic distribution

Table 1: Demographic Distribution of Respondents (n=82)

Gender			
Male		*Female*	
35 (42.68%)		47 (57.32%)	
Age			
16-20yrs	*21-25yrs*	*26yrs & above*	
54 (68.85%)	27 (32.93%)	1 (1.22%)	
Subject background			
Science	*Management/ Social Sciences*	*Arts*	*Education*
21 (25.61%)	11 (13.41%)	20 (24.39%)	30 (36.59%)

The gender distribution shows that the female (57.32%) is more than the male (42.68%). The age distribution shows that the majority of the

respondents (65.85%) are within the age bracket of 16 to 20 years. The subject background of the respondents shows that the Education (36.59%) has the highest frequency, followed by Science (25.61%), Arts (24.39%) and Management/Social Sciences (13.41%).

The respondents are from fifteen (15) different states in Nigeria. However, Ekiti tops the list with 24.39%, followed by Osun with 21.95% and Oyo with 12.19%. Three of the respondents (3.66%) fail to indicate their state of origin.

Career selection

The items related to career selection are appended in Table 2 below.

Table 2: Choice of LIS as Career (n=82)

S#	Statement	Agree	Disagree
1	I made FUOYE my first choice	78 (95.12%)	4 (4.88%)
2	I wish to be a lecturer in LIS	62 (75.61%)	20 (24.39%)
3	I intend to be a practicing librarian	64 (78.05%)	18 (21.95%)
4	I wish to quit LIS course, if possible	19 (23.17%)	63 (76.83%)
5	I am determined to study LIS	65 (79.27 %)	17 (20.73 %)

The majority of the respondents 78 (95.12%) agreed that they made FUOYE their choice because it was a federal institution of repute while 4 (4.88%) disagreed with this assertion.

The study also revealed that 75.61% of the respondents wished to be academics in the near future while 24.39% of the respondents had contrary views. It can also be seen from the above that 78.05% of the respondents intend to be practicing librarians in the near future, while 21.95% of the respondents are opposed to this claim.

Some of the respondents (23.17%) still intend to change their course and quit Library and Information Science, while 76.83% of the respondents have made up their mind to remain in the profession.

From the above, 79.27% of the respondents further established and reaffirmed the fact that they are already determined to study Library and Information Science, while 20.73% are still undecided.

Sources of selecting LIS discipline/career

The respondents were asked how they got to know about LIS as a discipline. The majority of the respondents got to know about Library Science through their mentor (23, 28.05%), followed by parents (21, 25.61%) and relations (12, 14.63%).

In response to question "what informed your decision to choose/study LIS," the majority (46, 56.09%) decided to study LIS on their own personal volition (interest), while 22 (26.83%) opted it casually or by chance.

With regard to various LIS career paths, the majority wished to be academics (49, 59.76%), followed by university librarians (10, 12.19%), and librarians in banks, oil companies or other industries (11, 13.41%).

Recommendations

Keeping in view the findings of this study, the following is recommended to guide the prospective career seekers.

- Youth should be encouraged to choose librarianship as a career because of its bright prospects.
- Librarians should mentor the youths to enable them have an insight into librarianship and the prospects therein.
- The various Library schools, that is the Departments of Library and Information Studies should create awareness and let the public, particularly the secondary school leavers (youths), know of their programs.
- Parents should care to seek information from tertiary institutions, particularly on career choice for their children and guide them accordingly.
- The guidance counselors too have a role to play to ensure that the youths are well guided.
- Orientation for freshmen, seminars and workshops should be held regularly to further educate and enlighten the students on the prospects of librarianship as a career.

Conclusion

Library and Information Science professionals may serve as academicians or practicing librarians.

Therefore, future Librarian can aspire to either go into academics or remain a practicing librarian, educationally, there is provision/room to read to Master and PhD levels. So many academic librarians are professors while a number of practicing librarians hold PhD degrees. All full-fledged librarians working in tertiary institutions are also academic staff and they are treated as such.

The future of librarians is bright in Nigeria. However, there are instances of university/polytechnic/college librarians, who after completing their terms in their respective institutions, go back to take up

lecturing jobs in the department of library and information studies. They also become professors. The sky, therefore, is not the limit for any hardworking librarian, but a starting point.

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11. See some examples below.

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Tables

Table 1. Student Mode of Study (n = 230)

Mode	Frequency	Percent
On-campus	162	70.43
Off-campus	29	12.61
Both (mixed mode)	39	16.96

Note. Figures taken from 2015 calendar.

Figures

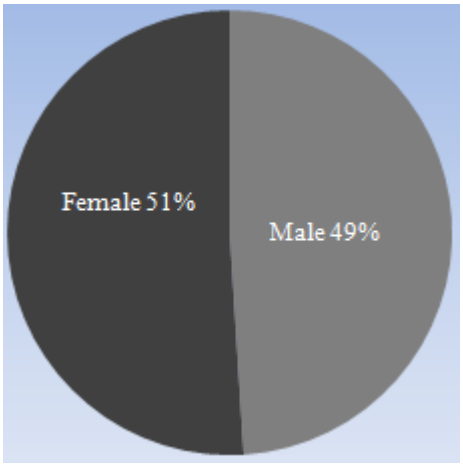

Figure 1. Pie chart of population (n = 230)

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Author 1
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Author 1 email address

Subsequent authors
Subsequent authors' institutional affiliation(s)

Next to Title Page

Title of Paper

Abstract

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Design/methodology/approach:
Key findings:
Research limitation(s):
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