

The Importance of Search Engines for Information Retrieval to Lecturers of Bauchi State University, Gadau, Bauchi State

Abdulkarim Abdullahi (MLIS)*, Jamilu Abubakar (BLIS)** & Umar Abubakar (BLIS)*

Abu Ali Library, Aminu Saleh College of Education, Azare. Library and Information Science, Tatar Ali Polytechnic Bauchi.

Corresponding author: abuaishatufarida@gmail.com

Abstract

This study was conducted to investigate the importance of search engines for information retrieval to lecturers of Bauchi State University Gadau. The study used quantitative research methodology using cross sectional survey design to collect data from the respondents. The population of the study comprises all the lecturers of Bauchi State University Gadau. Thus a sample size of one hundred and twenty six (126) was drawn from the population. Simple random sampling was used. A questionnaire was used as research instrument in collecting the data. The data collected was analysed using descriptive and inferential statistics. For the inferential statistics, the first null hypothesis was tested using t-test, while the second one was tested using ANOVA and the first one revealed that there is a significant difference between importance and use of search engines and the second one revealed that only gender is not significant but age and qualification were significant. And for the descriptive statistics, the findings revealed that search engine is highly important to lecturers; the study also revealed that, easy access to information, saving user's time, ease of use, quick response time and access to wider range of information were factors that make search engines relevant and important to the lecturers. The finding also revealed that, there are sufficient ICT infrastructures to support the use of search engines in the university. It also revealed that, poor network, lack of information retrieval techniques and low network bandwidth were problem hindering the use of search engines to retrieve information. The study recommended that lecturers should be equipped with latest versions of ICT infrastructures that will aid the use of search engines for Research and academic purpose.

Keywords: Search engines, Information retrieval, Lecturers, University.

Introduction

The ever-increasing amount of digitally available documents also brings with it the demand for a quick and targeted search. In the classical sense, this refers to the search for text documents. However, information must always be recovered for all multimedia documents. In addition to the main application of search engines, the information retrieval process includes also relevant for digital libraries, image databases or multimedia archives. The aim of search engines according to Butters (2009) is to search and circumnavigate meaning that a successful search engine should sustain its users in an efficient search for contents and bring detailed information resources with ease to various lecturers. Mark (2012) stated that the search engines obtainable are very many but due to lack of

awareness, researchers do not exploit them. Internet and the various search engines have brought information explosion, which means that there is large scale, rapid and spectacular expansion of information. The information explosion may confuse researchers on the information to use (Jonan, 2010). Thus, the need to create awareness of the importance of search engines for scholarly articles.

Information Retrieval is a field concerned with the structure, analysis, organization, storage, searching, and retrieval of information. It is a well-established discipline in Computer Science since the 1950s. It has, however, recently enjoyed increased significance because of the information explosion caused by the internet WWW and its related technologies. Not only the absolute amount of information but also new types of information formats have drawn attention to this field (Lally, 2006). While IR used to be a restricted field with specialized users like librarians and information professionals, today millions of people use IR every day to search the web or search their email, resulting in the need for new user interfaces and query languages (Manning *et al.* 2008; Hearst 2011; Danica *et al.* 2013).

According to (Omotara 2011)? Information Retrieval *"deals with the representation, storage, organization of, and access to information items." "IR is finding material (e.g. documents) of an unstructured nature (usually text) that satisfies an information need from within large collections (usually stored on computers)." The most common task in IR is informally ad hoc retrieval: a user expresses an information need by submitting a query to the system, which tries to return documents relevant to this query. Other tasks in IR include support of users in browsing or filtering document collections, text classification, text clustering, cross-language retrieval, and multimedia retrieval (Manning et al. 2008; Lew et al. 2006; Roul and Sahay, 2012).*

It is therefore, in view of the above that, the need to study the importance of search engines for information retrieval to lecturers of Bauchi State University arises. The research is hoped to measure the competence or otherwise of the problems associated with the importance of search engines for information retrieval to lecturers in Bauchi State University Gadau, which if successfully conducted will no doubt fill in the gap in the area of research and add to the existing body of knowledge in the area of Information Retrieval. It is also hope that, the study will have a significant value to the researchers, more especially the lecturers in enhancing the search engines for Information Retrieval and to promote their use for research and other scholarly activities.

Different types of research methodologies such as, quantitative, qualitative and mixed method research methodology were adopted in various studies in the field of Information Retrieval. However, looking at the nature of the research population of this study, the quantitative research methodology was adopted, because it is assumed to be the best methodology for this study. Moreover, survey research design was used as the most appropriate and easy framework of generating data from a larger population as in the case of this study. Bebbie and Mouton (2001) posited that, one of the strength of survey research

design lies on its potentials to generalize the findings in sub-group to the general population if appropriate design has been implemented in combination with standardized questionnaire. Furthermore, descriptive and inferential statistics were used for data analysis of this study using SPSS in presenting the data.

The following are specific objectives of the research:

1. To investigate the importance attached to the use of search engines for information retrieval by lecturers in Bauchi State University Gadau.
2. To ascertain the ICT infrastructure available to support the use of search engines for information retrieval in a university study.
3. To identify the problems limiting the use of search engines for Information Retrieval in a university study.

Research Questions

1. What is the importance attached to the use of search engines for Information Retrieval by lecturers in Bauchi state University Gadau?
2. What ICT infrastructure is available to support the use of search engines for Information Retrieval in the university under study?
3. What are the problems limiting the use of search engines for Information Retrieval in Bauchi State University Gadau?

Review of Related Literature

Importance Attached to the Use of Search Engines for Information Retrieval in Institutions of Higher Learning

Internet search engines have a favorable impact on all facets of the social and economic growth of people. "The flexibility of time-space accounted for by the incorporation of Internet search engines into teaching and research processes assists in boosting engagement and reception of information," claims Cabero (2001). These scenarios offer alterations to academic teaching and research methodologies as well as communication models, paving the way for novel circumstances that support both individualized and group learning. Internet search engines increase the flexibility of delivery of education so that learners can access knowledge anytime and from anywhere. This in turn would better prepare the academics for lifelong research as well as to improve the quality of teaching. One of the most vital contributions of Internet search engines in the field of education is - Easy Access to Learning. With the help of search engines, academics can now browse through e-books, e-journals etc. and can also have an easy access to research resources all over the world.

The incursion of the internet search engines into the educational sector, according to Bada, Adewole & Olaleka (2009) provides the possibilities to solve teaching and learning problems even more rapidly and accurately than previously conceived. This has eventually made the internet search engines the doyen of humanities as it continues to extend greater

acceptance. The search engines, according to Jayesimi (1999), as cited by Joe (2011) have become the neology in our society and possibly innovative years ahead. In schools, computers are widely used; and the need for internet search engines and literacy in the educational system has become more relevant. It has been found to be effective device for presentation of instructional programme.

According to Lindary and McLaren (2010) university researchers use search engines for research and make evaluation on the quality and type of research materials being used. In addition to the above, Burton and Chadwick (2012) noted that some of the researchers depend solely on e-resources in writing research papers. Majority of the researchers use a combination of library and online resources. This does not, however, mean that researchers are necessarily choosing the best or most pertinent sources relating to their topics. Instead, as emphasized by Lindary and McLaren (2010), they depend on giving the most positive ratings to sources that are easy to understand, easy to find and available. The e-resources are very easy, convenient and accessible making them major factors influencing academic use. Joe (2011) conducted a survey study on information technology acceptance by professionals in Delta State University, Nigeria. To access the users using search engines, a seven-item questionnaire was used to collect data from a sample of 211 users of which 201 users completed the survey, and response rate was high. He found out that 80 (97.95%) respondents used Google daily, while 65 (74.70%) respondents used Yahoo 2- 3 times a week, while 14 (15.09%) respondents used Bing once a week. It was also discovered that 12 (13.50%) respondents used Netscape twice a week, while 10 (11.49%) respondents use AOL once a month, while 10 (11.49%) respondents used Lycos twice in a month and 10 (11.49%)?. From the findings, it showed that many users make more use of Google than other search engines because of the knowledge of Google to them. A survey research conducted by Thanuskodi and Ravi (2011) on use of digital resources by faculty and research scholars of Manonmaniam Sundaranar University, the result shows that 67.14% of the faculty were familiar with the use of search engines.

Jamali and Asadi (2010) show that the vast majority of students prefer to use article index databases when searching for scholarly articles in particular. Libraries provide reliable scholarly materials and all the resources needed to conduct research: journal and magazine subscriptions, books, article database subscriptions, etc. Web search engines, however, search across a variety of resources. The interviews conducted by Jamali and Asadi (2010) showed that one of the most valued benefits of Google as a search engine is that it is not limited to a specific research domain. It indexes everything that is available online. Interviewed students also pointed out they considered the search engine a good "point to start". For the most part they agree that it gives them a quick overview of an area that they may not know much about. Moreover, if searchers use Google Scholar, they will receive results that index everything containing the keywords entered in the search box. Scholar conducts a federated search across multiple databases. Arguably, as Adomi, E.E (2010) demonstrates, using the search engine can produce better results. They may provide more

inter-disciplinary results by spanning multiple areas of study. Cheney and Perry (2005) compare the comparative size of Yahoo! and Google's indexes. Mowshowitz and Kawaguchi (2005) examined the difference between web search engine results from an expected distribution.

ICTs Skills of Lecturers for Information Searching

The use of Information and Communication Technology (ICT) as a tool for enhancing students' learning, teachers' instruction, and as catalyst for improving access to quality education in formal and non-formal settings has become a necessity. Simply having ICT in schools will not guarantee their effective use. Regardless of the quantity and quality of technology available to lecturers and students the key to how those tools are used is the researcher's skill; therefore, lecturers and students must have the competence and the right attitude towards technology (Kadel, 2005; Yusuf & Balogun, 2011). Observation has shown that there is a low level of skilfulness in the use of ICT among respondents (Obuh, 2009; 2010). He further suggested that the skills required to maximize the potential of internet search engines that pave way to electronic resources are much greater than those required for searching printed sources. These skills include knowledge of the structure of the data base and the instructions which must be input into the computer by the searcher, as well as an understanding of the ways in which the instructions are linked with one another.

ICT literacy skills comprise a 21st century form of literacy, in which research and communication of information via digital technology are as important as reading and writing were in earlier centuries (Katz, 2005). In 2002, the Educational Testing Service (ETS) convened an international panel which comprised of academics, development specialists and telecommunications experts representing the governmental and private sectors to study the growing importance of existing and emerging ICT (Katz and Macklin, 2006; Pernia, 2008). The international panel defines ICT literacy as the ability to use digital technology, communications tools and networks to access, manage, integrate, evaluate and create information in order to function in a knowledge-driven society (Kenney, 2006). Krubu and Osawaru (2011) conducted a study on the impact of ICTs in Nigerian universities. The survey design was employed, data were collected through questionnaire, and simple percentages were used for the analysis of data. The authors found that out of the 48 respondents studied, majority of the respondents who have good computer skills are 21 (43.7%), followed by those that have fair computer skills, they are 19 (39.6%) respondents; few of the respondent representing 5 (10.4%) had no skill at all. Only 3 respondents representing 6.3% had excellent computer skills. The result of the study revealed that majority of the respondents, i.e. 18 (37.5%) acquire ICT training skills via formal training; followed by 17 (35.4%) respondents which also acquired the skills via trial and error, while few i.e. 10(20.8%) respondents acquired ICT skills via self - study and the least was 3 (6.3%) respondents that acquired the skills via staff-in-house training.

Al-Ansari (2006) as cited by Nweze (2010) focused on the Internet search engines use by the faculty including purpose of use, impact on teaching and research, Internet resources that they use and the problem faced while using the Internet search engines. It was discovered that majority of them have been using the computer and Internet search engines for more than five years. The Internet search engines have helped them save time, find up-to-date information and compare with their colleagues. Almost all of them want to improve their Internet search engine use skill through formal training. Bassi and Camble (2011) stated that different studies have identified how researchers acquire their search skills for the use of search engines to access e-resources. Klatt (2001) opined that a majority of search engines users obtained their knowledge by trial and error or with the help of fellow users. Similarly, Adomi, Omodeko, and Otlo (2004) revealed that electricity failure has been a persistent problem limiting against ICT application and usage in Nigeria. This also prevents universities with ICT facilities for academics to use them regularly. In this same vein most students acquired Internet knowledge and skills through practical self-teaching. (Adomi, et.al, 2003; Adomi, 2005).

ICT Infrastructures to Support the Use of Search Engines in Institutions of Higher Learning

The building blocks of ICTs are the communication processes and infrastructures. ICT refers to information and communications technologies such as computers and the Internet, as well as fixed-line telecommunications, mobile phones, other wireless communications devices, networks, broadband and various specialized devices ranging from barcode scanners to global positioning systems (Singapore: Ministry of Economic Development, 2004).

According to Vanderlinde and van Braak (2010), ICT infrastructure measures the perceived availability and suitability of the ICT tools such as hardware, software and peripheral equipment provided in the universities. In Pelgrum's (2001) study, ICT infrastructure refers to the availability of equipment, software, Internet access and other similar resources in the institution of higher learning. Additionally, resources and facilities in universities are designed and enabled in the direction of supporting continuous transformation and use of various search engines to retrieve vast information that will assist lecturer in effective delivery of learning and research (Anderson & van Weert, 2002). In the year 1998, Krysa conducted a research to determine and examine regularly occurring factors that affect the implementation of the technology among the university lecturers. A qualitative study among four university lecturers was carried out to identify the factors. Based on the findings, it was reported by one of the lecturers that the outmoded hardware limits the use of search engines in the institution of higher learning (Krysa, 1998). The lecturer was not able to effectively use search engines to retrieve information due to the old and outdated hardware. Conversely, one of the informants stated that limited software act as one of the

antecedents that prevents the use of search engines as a means of accessing information (Krysa, 1998).

ICT infrastructure is crucial for universities to meet their objectives for information management, efficient use, and extension of boundaries from the four walls to the world. ICT infrastructure gives lecturers the chance to offer value-added information through relevant research papers, university teaching, and access to a wide range of digital-based resources. Modern ICT is being used by universities to automate key processes, create effective and efficient information searches, and foster collaboration and resource sharing through networks. They use ICT to create institutional repositories (IR) of local digital content, digital libraries, and management information systems (MIS). (Rana, 2008).

Types of Search Engines for Information Retrieval and their Evaluation

The Internet has grown into a powerful force that has affected academic study. It is a massive network of linked computers and virtually unlimited sources of knowledge. Interviews with users in research at Carnegie Mellon University support this pattern (George, Bright, and Hurlbert, 2006). The study found that most users, especially business majors (91%), used the Internet as their main source of search results. The internet was seen as "very handy" and a crucial search resource. In 2003, a Cornell University professor and staff study revealed that 73% of respondents utilized the internet every day for searches, whereas only 50% of respondents accessed library websites (Poland, 2004). In 2003 and 2004, a survey of more than 25,000 users and staff also identified that a large number of researchers used Internet search engines in their studies (60-67%). This shows how important search engines for information retrieval is to academic and research institutions.

Methodology

Quantitative research methodology was employed because the research approach is considered suitable for the study looking at the area of coverage and the study population; there is a possibility of making generalization of the findings as stated by Gorman and Clayton (2005).

The researcher found it very relevant for this study, as it enables the premises to obtain relevant information from the population or its sample through a well-structured questionnaire. The quantitative research methodology provides significant premises that best describe and explain the major objectives of the study.

Questionnaire was used for data collection for this study. A questionnaire is a form containing questions about the research problem that is distributed to the respondents for their reactions. They are meant to discover the feelings, beliefs, experiences or activities of respondents. Data collected from this study were analysed using frequency distribution tables and descriptive and inferential statistic.

The data was coded, tabulated and analysed using Statistical Package for Social Science (SPSS) software and Excel. Descriptive statistics such as frequency distribution,

percentages and mean were used and the mean value is greater than 3.0 of cutting mark as a minimum for acceptance of the sets of questions raised. For inferential statistics t-test was used in testing the hypotheses, the decision rule was to accept the null hypothesis where the t-calculated value of the t-test is less than 0.05% level of significance otherwise is rejected.

Analysis of Data Collected

Level of Usage of Search Engines

The goal of the study was to determine how frequently university lecturers found the used search engines significant to their research work. The information on search engine usage is shown in the table below.

Level of usage of search engines by Lecturers in the university

Sn	Search Engine	Daily	Weekly	Monthly	Occasionally	Never	Mean	Std.Dev
1.	Google Scholar	126 (63%)	31 (15.5%)	0	33 (16.5%)	10 (5%)	4.15	1.314
2.	Opera	140 (70%)	35 (17.5%)	8 (4%)	17 (8.5%)	0	4.49	0.919
3.	Yahoo	103 (51.5%)	45 (22.5%)	15 (7.5%)	36 (18%)	1 (0.5%)	4.07	1.165
4.	Bing	10 (5%)	27 (13.5%)	6 (3%)	104 (52%)	53 (26.5%)	2.19	1.121
5.	Dogpile	12 (6%)	17 (8.5%)	12 (6%)	97 (49%)	62 (31%)	2.10	1.116
6.	AltaVista	5 (2.5%)	21 (10.5%)	14 (7%)	98 (49%)	42 (31%)	2.05	1.014
7.	Ask Jeeves	23 (11.5%)	16 (8%)	0	93 (46.5%)	68 (34%)	2.17	1.295
8.	Google chrome	120 (60%)	40 (20%)	7 (3.5%)	14 (7%)	19 (9.5%)	4.14	1.326
9.	Mozilla Firefox	115 (57.5%)	33 (16.5%)	11 (5.5%)	24 (12%)	17 (8.5%)	4.03	1.373
10	MSN	24 (12%)	32 (16%)	19 (9.5%)	101 (50.5%)	24 (12%)	2.66	1.230

ICT infrastructure available to support the use of search engines

The purpose of the study was to learn what ICT infrastructure was offered to enable search engine usage in the university. The ICT infrastructure that is available to support the use of search engines is detailed in the table below.

ICT Infrastructures available to support the use of search engines in the university

S/NO	INFRASTRUCTURES	SA	A	UN	D	SD	Mean	Std. Dev.
1.	There is Internet service in the universities	98 (49%)	63 (31.5%)	5 (2.5%)	34 (17%)	0	4.13	1.089
2.	Computers are made available	65 (32.5%)	103 (51.5%)	10 (5%)	22 (11%)	0	4.06	0.903
3.	Network bandwidth	45 (22.5%)	96 (48%)	15 (7.5%)	36 (18%)	8 (4%)	3.67	1.130
4.	Hardware	74 (37%)	106 (53%)	3 (1.5%)	16 (8%)	1 (0.5%)	4.18	0.849
5.	There is constant power electricity supply	29 (14.5%)	58 (29%)	22 (11%)	76 (38%)	15 (7.5%)	3.05	1.247
Decision mean							3.00	

Table above shows the Infrastructure available to support the use of search engines for information retrieval in the universities. The Table revealed that Items 1, 2 and 3 have the mean scores of 4.13, 4.06 and 4.18 respectively which are far above the decision mean of 3.00. This implies that infrastructure such as Internet service; computers and printers are available to support the use of search engines for information retrieval in the university. However, Items 3 and 5 had the mean score slightly above the decision mean.

Problem Hindering the Use of Search Engines for Information Retrieval

The study sought to investigate the problem hindering the use of search engines for information Retrieval in the university. The question was addressed to the lecturers of Bauchi State University Gadau in Table 4.10 shows the detail of the problem hindering the use of search engines.

Problem Hindering the Use of Search Engines for Information Retrieval

S/NO	ITEMS	SA	A	UN	D	SD	Mean	Std. Dev
1.	Lack of information retrieval skills	43 (21.5%)	8 (4%)	10 (5%)	76 (38%)	8 (4%)	3.29	1.281
2.	Lack of confidence in using search engines	18 (9%)	68 (34%)	22 (11%)	89 (44.5%)	3 (1.5%)	3.05	1.100

3.	Poor ICT infrastructures in the universities	41 (20.5%)	56 (28%)	35 (17.5%)	59 (29.5%)	9 (4.5%)	3.31	1.220
4.	Insufficient time to use search engines	33 (16.5%)	71 (35.5%)	33 (16.5%)	61 (30.5%)	1 (1%)	3.36	1.112
5.	Difficulty in finding relevant information	16 (8%)	61 (30.5%)	22 (11%)	87 (43.5%)	14 (7%)	2.89	1.155
6.	Problem of network failure from time to time.	41 (20.5%)	119 (59.5%)	19 (9.5%)	14 (7%)	7 (3.5%)	3.87	0.939
7.	High cost of internet access	24 (12%)	68 (34%)	32 (16%)	67 (33.5%)	9 (4.5%)	3.16	1.148
8.	Low Bandwidth	50 (25%)	100 (50%)	19 (9.5%)	25 (12.5%)	6 (3%)	3.82	1.042

Table above shows that only item 5 (difficulty in finding relevant information, was not identified as part of the problems hindering the use of search engines for information retrieval in the universities under study. The mean score of item 5 (2.89) was found to be lower than the decision means (3.00), while other items had the mean scores above the decision mean. These items (1, 2, 3, 4, 6, 7 and 8) were strongly identified as problems hindering the use of search engines for information retrieval in the universities under study.

Conclusion

The research work concludes that:

- Lecturers in Bauchi State University Gadau preferred to use Google scholar, Google chrome, Firefox and opera as their search tools.
- The lecturers found search engines to be essential tools for information retrieval.
- The ICT infrastructure obtainable to support the use of search engines in the university under study were: internet service, computers and Network bandwidth.
- That the problems hindering the frequent use of search engines for information retrieval in Bauchi State University Gadau included: lack of information retrieval techniques; insufficient time to make use of search engines; poor network from time to time and high cost of internet access. The findings revealed the above listed problems as threat to the benefits drawn from the use of search engine to information retrieve information.

Recommendation

The research work recommends the following:

- In light of the findings of the study, it is recommended that, there is need for the university to organize seminars/workshops on information retrieval so that the lecturers will improve their skill of retrieving effective information.
- For effective use of search engines, the study recommends, the need for the provision of latest ICT infrastructure that will pave way for easy use of search engines in the University.
- In tackling the problem of network failure based on the findings of the study, the study recommends that, there should be a very strong internet service in the University.
- For frequent use of search engines, the study recommends that there should be free internet service in the University.

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