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EMPIRICAL STUDY OF THE AWARENESS AND UTILIZATION OF INTERNET SEARCH ENGINE AMONG UNDERGRADUATE STUDENTS OF NIGERIAN UNIVERSITIES FOR EFFECTIVE INFORMATION RETRIEVAL ON THE WEB.

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EMPIRICAL STUDY OF THE AWARENESS AND UTILIZATION OF INTERNET SEARCH ENGINE AMONG UNDERGRADUATE STUDENTS OF NIGERIAN UNIVERSITIES FOR EFFECTIVE INFORMATION RETRIVAL ON THE WEB.

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Abstract

The study examined the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web. The study adopted descriptive survey research design. Undergraduate students of government owned Universities in Southeast, Nigeria made up the population of the study. 525 undergraduate students sampled for the study using multistage sampling technique. Structured Questionnaire was constructed by the researchers and used for the study. Data collected were analyzed using frequency count, percentage, mean and standard deviation. All computation of collected data was done with SPSS version 22. Real limit of number was adopted for taking decision. The study revealed that majority of the students are highly aware of Google, while only few are aware of Google scholar, Yahoo and Bing. It was also revealed that only Google was highly utilized among the students, while Google scholar, Yahoo and Bing are less utilized. The extent of awareness and utilization of Internet search engine contribute greatly to effective information retrieval on the web among undergraduate students of Nigerian Universities. the major challenges affecting the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web are erratic electric power supply, high cost of internet access through data subscription, lack of search skills, slow internet connectivity, lack of fund to acquire personal computer or smartphone, techno-stressed, poor data transmission, and inadequate telecommunication infrastructure around campus. The study recommended among other things that, Adequate awareness of other internet search engines should be created among undergraduates. Most especially specialized search engine like google scholar and others.

Undergraduates should be enlightened and encouraged through library user education to always utilize internet search engines for effective information retrieval.

Keywords: Internet Search Engine, Undergraduate Students, Nigerian Universities, Effective Information Retrieval, Utilization, Awareness.

Introduction

The emergence and advancement of the Internet and its resources as well as services has brought a great in the education sector globally. Hundreds of millions educational resources and services can be accessed over the Internet. Retrieving information on the Internet is easier with Internet search engine. Usually, internet users prefer search engines to access required information from the internet because search engines are open for public use with billions of web sites. Internet search engines also make it possible for users to search for Internet resources and services using key words.

Search engines are programs that search documents for specified keywords and return a list of the documents where the keywords were found. According to Encyclopedia of Library and information science (2015) search engine is a computer program that allows the user to search the internet and find particular terms or phrases. The software allows this search to be made at very high speed, so that search engines have become an essential tool in Internet usage, and particularly in searching the World Wide Web. One of the main components of search engine is a robot which is known as Web Crawler (or Spider) and it works as a network surfer and downloads a searched web site to local disk. According to Otagburuaga and Tivde (2010) Internet search engine works by sending out a spider to fetch as many documents as possible. Another program, called an indexer, then reads these documents and creates an index based on the words contained in such that, ideally, only meaningful and related results are returned for each query.

An internet search engine is a website that acts like a massive catalogue of the pages available on the internet (Poulet, Hiom and Mcmenemy, 2015). Also, Onah, Adayi, Okonkwo, and Onyebuchi (2020) opines that, Internet search engines use software called a robot, a spider or a crawler to index pages from the web into its searchable databases. Search engine is designed to search for information on the World Wide Web. The search results are usually presented in a list of results and are commonly called hits. According to Onah, Adayi, Okonkwo, and Onyebuchi (2020) some search engines mine data available in databases or open repositories or directories. Hence, search engine operates algorithmically or are a mixture of algorithmic and human input.

By algorithm, we mean the step-by-step methods involved in providing solutions to the search results.

There are many kinds of search engine; these Google, MSN, Bing, Ask, Yahoo, Lycos, AllTheWeb, Yandeks, Baidu, Sin, Live W, Owl, Infospace, MyWebSearch, Altavista, Google scholar and AllTheWeb. There are thousands of search engines available; the most currently used are google, Bing and Yahoo (Bothma, Cosijn, Fourie and Penzhorn, 2014). Search engines technology has developed along with the development of website technology. The number of search engine users is also increasing rapidly every day. In 2017, Similar Web and Alexa noted that in 2017 and early 2018, Google was still the most visited search engine by the cyber community. Search engines become gateways used to track various information needed by students. however, the ability to utilize internet search engine largely depend on the level of awareness of search engine.

Awareness is the ability to directly know and perceive, to feel, or to be cognizant of events. More broadly, it is the state of being conscious of something. Another definition describes it as a state wherein a subject is aware of some information when that information is directly available to bring to bear in the direction of a wide range of behavioral actions. Awareness is the state or ability to perceive, to feel, or to be conscious of events, objects, or sensory patterns. In this level of consciousness, sense data can be confirmed by an observer without necessarily implying understanding. Awareness of search engine is the state of being conscious of the existence or availability of the various search engines used to search and retrieve information from the web. According to Daniel and Oghale (2015) awareness is a necessity to the usage of search engines. For an individual or student to participate in any work or activities, awareness about the environment, how things are done and should be done is very important. Awareness to Internet search engine is necessary for effective utilization of Internet search engine for information retrieval.

Utilization is derived from the verb use or utilize which connotes use and derivation of benefits from something. Adams (2010) further explained that students have very confused understanding of various search engines and its concept. More so, many students are not yet involved with various internet search engines. Shearer (2008) noted also that the utilization of the various search engines is very low, except for Google. When Internet search engines are effectively

utilized among undergraduates, the extent of information retrieval will be high thus improving the quality of their academic output.

Information retrieval is the processes involved in representation, storage, searching, finding, and presentation of potential information desired by a human user. Keenan and Johnston (2016) stated that information retrieval is the process of searching a collection of items in order to identify those documents that deal with a particular subject of interest to the searcher. From these definitions it is evident that information retrieval excludes non – relevant documents. However, information retrieval encompasses finding relevant as well as non – relevant records of documents or actual documents. According to Fordjour, Badu, and Adjei (2010) Information retrieval is concerned with retrieving documents that are likely to be relevant to a user's information need as expressed by his request. A request is an imperfect expression of a user's information need; only a user will be able to tell whether a document contains the information he is seeking. The ability of an undergraduate student to select relevant documents from the non-relevant ones aid in effective information retrieval and utilization from the web using search engine.

Study carried out by Ogbole (2017) revealed that *Google and yahoo are the two major internet search engines used among undergraduates studied*. Similarly, only Google and yahoo are used to a very high extent among the undergraduates. Shanahan (2008) found out that Google, Wikipedia and Ask.com are the most utilized internet search engine, however, Google is the major search engine used among undergraduates. Lazonder (2000) in a study found out that the extent of utilization of the various search engines is very low, except for Google. Véronis (2014) study revealed that Google is the most utilized internet search engine, followed by Yahoo, then Bing. Adams (2010) in another empirical study also found out that Google is the most utilized internet search engine. Jamali, and Asadi, (2010) found out that Google and Yahoo are the major internet search engine utilized among students for Internet banking services. Oyewole, and Alegbeleye (2018) found out that Google was their most used search engine among students.

Studies have shown over time that students have low awareness level of internet search engine except Google and few others out of over 100 internet search engines online. Brand-Gruwel, Wopereis, and Vermetten (2005) found out in a study that the level of awareness of internet search engine among students is low as majority of the students are only aware of Google, Yahoo and Ask.com, with little or no knowledge of other search engines. Similarly, Imoniwe (2018) found out that Undergraduate Students level of awareness of search engines was low.

Though the level of awareness of most of the internet search engine is low except Google, Yahoo and Ask.com, Imoniwe (2018) found out that students utilize internet search engine for many reasons, the major of which are to obtain more up-to-date resources, Online library resources for research, links them up to abundance of information online at low cost and improve the quality of their academic output among others.

Some challenges affecting effective use of internet search engine among undergraduates are Erratic electric power supply, High cost of Internet access through data subscription, Lack of search skills, Slow Internet connectivity, Lack of fund to acquire personal computer or smartphone, Techno-stressed, Poor data transmission and Inadequate telecommunication infrastructure around campus among others. Ogbole (2017) identified Poor network connectivity, some results released are irrelevant, inadequate skills and high cost of internet access. Similarly, Shearer (2012) identified poor internet connectivity, high cost of internet tariff, high cost of personal computers, low internet bandwidth, poor telecommunication infrastructures among others. also, Joe (2011) found out that the major challenges affecting effective utilization of internet search engine re poor internet connectivity, slow internet access and high data traffic.

Some strategies to enhance the level of awareness and utilization of internet search engine among undergraduate students of Nigerian universities for effective information retrieval on the web are subsidizing the cost of acquiring personal computer or smartphone for students, provision of high internet connectivity, students should adopt techno-stressed management strategies, high data transmission, provision of adequate telecommunication infrastructure around campus, provision of constant electric power supply, subsidize the cost of internet access through data subscription, and training students on acquiring adequate search skills among others. Ogbole (2017) recommended that Librarians should provide knowledge about different online search engines to undergraduate students and not just Google and Yahoo through user education. Also, Webmasters should advertise the other online search engines online so as to increase knowledge and patronage to them. Ozonuwe, Nwaogu, Ifijeh and fagbhun (2018) recommended that university authority should work at increasing bandwidth this will help to boost the speed of the internet browsers and enhance the use of search engines.

Undergraduates need information to enhance their academic activities such as further reading, note making, assignment, research, personal development, entertainment news, final year project and so on. In the 21st century majority of information for meeting the needs of

undergraduates are easily found online. Thus, search engine is an easy means of information search and retrieval online. The online search engines therefore provide undergraduate students with the vital information they need to support their learning and also help to satisfy their information quest on daily basis. So many undergraduate students rely on search engines as their primary source of information retrieval in this 21st century. Thus, the extent of information retrieved by undergraduates depends on their awareness and effective utilization of the various Internet search engine for information retrieval. It is a known fact that some Internet search engine accepts more Boolean operation than others when searching the Internet. Thus, if undergraduates are limited to few Internet search engine, the information they will retrieve will be few and inadequate to meet their information needs.

From the foregoing, it is necessary to examine the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web.

Purpose of the Study

The main purpose of the study is to empirically examine the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web. Specifically, the study seeks to:

1. Examine the level of awareness of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web
2. Examine the extent of utilization internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web
3. Ascertain the extent to which the awareness and utilization of Internet search engine contribute Effective Information Retrieval on the web among undergraduate students of Nigerian Universities
4. Identify the challenges affecting the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web.

5. Proffer strategies to enhance the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web.

Research Questions

The following research questions guided the study:

1. What is the level of awareness of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web?
2. What is the extent of utilization internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web?
3. What is the extent to which the awareness and utilization of Internet search engine contribute Effective Information Retrieval on the web among undergraduate students of Nigerian Universities?
4. What are the challenges affecting the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web?
5. What are the strategies to enhance the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web?

Methodology

The study adopted descriptive survey research design. Descriptive survey research design aims at collecting data on and describing it in a systematic manner, the characteristics, features or facts about a given population (Nworgu, 2015). The descriptive survey was considered appropriate because this study seeks to collect, describe and summarize empirical data on the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web. Undergraduate students of government owned Universities in Southeast, Nigeria made up the population of the study. 525 undergraduate students sampled for the study using multistage sampling technique. Structured Questionnaire was

constructed by the researchers and used for the study. The questionnaire consisted of two parts. The first part consists of the demographic of the respondents, while the second part consist of the research questions that guided the study. In distributing the questionnaires, the researchers employed the assistance of research assistants, who are undergraduate students in the Universities studied. Thus, one student each was trained to function as the research assistant. Data collected were analyzed using frequency count, percentage, mean and standard deviation. All computation of collected data was done with SPSS version 22. Real limit of number was adopted for taking decision.

Results

Out of 525 copies of questionnaire distributed to the respondents, 450 copies representing 85.7% was returned, which was valid for the study. The presentation and analysis were based on the five research questions guiding the study.

Table 1: Gender Distribution of Respondents

Gender	Frequency	Percentage
Male	209	46.4%
Female	241	53.6%
Total	450	100%

From the table 1 above out of 450 undergraduates that responded to the survey, 209 (46.4%) were male while 241(53.6%) were female.

Table 2: Mean Responses on the level of awareness of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web

S/N	Search Engine	HA	A	LA	NA	Mean	St. D	Decision
1	Google	279	171	0	0	3.62	0.49	Highly aware
2	Google scholar	102	226	77	45	2.86	0.88	Aware
3	Yahoo	121	171	111	47	2.81	0.95	Aware
4	Bing	138	141	109	62	2.79	1.03	Aware
5	Yandex	28	40	72	310	1.52	0.90	Low awareness
6	Dogpile	0	0	226	224	1.50	0.50	Low awareness
7	Naver	0	0	130	320	1.29	0.45	Not aware
8	Lycos	0	0	98	352	1.22	0.41	Not aware
9	AOL	0	0	65	385	1.14	0.35	Not aware
10	DuckDuckGo	0	0	57	393	1.13	0.33	Not aware

11	Altavista	0	0	39	411	1.09	0.28	Not aware
12	MSN	0	0	30	420	1.07	0.25	Not aware
13	Infospace	0	0	22	428	1.05	0.22	Not aware
14	Ask.com	0	0	14	436	1.03	0.17	Not aware

Table 2 above shows that undergraduates have highly aware of google. But aware of Google Scholar, Bing and Yahoo, with 2.86, 2.81 and 2.76 mean average respectively. While the undergraduates have low level of awareness in Yandex, DuckDuckGo, AOL, MSN, Altavista, Infospace, Ask.com, Naver, Lycos, Google scholar, and Dogpile

Table 3: Mean Responses on the extent of utilization internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web

S/N	Search Engine	VHE	HE	LE	NU	Mean	St. D	Decision
1	Google	271	179	0	0	3.60	00.49	Very High Extent
2	Google scholar	31	168	207	44	2.41	0.76	Low Extent
3	Yahoo	0	9	351	90	1.82	0.43	Low Extent
4	Bing	0	36	279	135	1.78	0.58	Low Extent
5	Dogpile	0	0	234	216	1.52	0.50	Low Extent
6	Naver	0	0	162	288	1.36	0.48	Not Utilized
7	DuckDuckGo	0	0	81	369	1.18	0.38	Not Utilized
8	Altavista	0	0	63	387	1.14	0.35	Not Utilized
9	AOL	0	0	45	405	1.10	0.30	Not Utilized
10	Yandex	0	0	36	414	1.08	0.27	Not Utilized
11	MSN	0	0	18	432	1.04	0.20	Not Utilized
12	Infospace	0	0	18	432	1.04	0.20	Not Utilized
13	Ask.com	0	0	18	432	1.04	0.20	Not Utilized
14	Lycos	0	0	18	432	1.04	0.20	Not Utilized

Table 3 shows that the extent of utilization of google for information retrieval among undergraduates is very high, with 3.60 mean average. The extent of utilization of Google, bing, and yahoo are low with 2.41, 1.82, 1.78 and 1.52 mean score respectively. While Yandex, DuckDuckGo, AOL, MSN, Altavista, Infospace, Ask.com, Naver, Lycos are not utilized among undergraduates for information retrieval.

Table 4: Mean Responses on the extent to which the awareness and utilization of Internet search engine contribute Effective Information Retrieval on the web among undergraduate students of Nigerian Universities

S/N	Items	SA	A	D	SD	Mean	St. D	Decision
3	The awareness of some Internet search helps me to meet my information need	333	72	18	27	3.58	0.83	Strongly Agree
2	Utilization of Internet search engine has reduce the time I spend to find information doing my academic work	243	198	9	0	3.52	0.54	Strongly Agree
3	With internet search strategies I have been retrieving enough electronic information for free	225	216	9	0	3.48	0.54	Agree
4	Awareness and utilization of Internet makes me to retrieve adequate information from the web when I search for information	285	87	60	18	3.42	0.87	Agree
5	Awareness and utilization of Internet search engine has helped me to search the web using keywords	249	147	42	12	3.41	0.77	Agree
6	Using advance search on internet search engine has helped me to retrieve high quality research papers	162	117	15 3	18	2.94	0.93	Agree

Table 4 show that the extent of awareness and utilization of Internet search engine contribute greatly to effective information retrieval on the web among undergraduate students of Nigerian Universities. The respondents strongly agreed that, the awareness of some Internet search helps me to meet my information need with 3.58 mean score. Utilization of Internet search engine has reduced the time I spend to find information doing my academic work, with 3.52 mean score. Also, Awareness and utilization of Internet improved in the retrieval of adequate information from the web, with 3.48. the least is that, using advance search on internet search engine has helped the students to retrieve high quality research papers.

Table 5: Mean Responses on the challenges affecting the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web

S/N	Items	SA	A	D	SD	Mean	St. D	Decision
1	Erratic electric power supply	378	45	27	0	3.78	0.54	Strongly Agree
2	High cost of Internet access through data subscription	288	162	0	0	3.64	0.48	Strongly Agree
3	Lack of search skills	288	162	0	0	3.64	0.48	Strongly Agree
4	Slow Internet connectivity	282	159	9	0	3.61	0.53	Strongly Agree
5	Lack of fund to acquire personal computer or smartphone	225	216	9	0	3.48	0.54	Agree
6	Techno-stressed	243	180	18	9	3.46	0.67	Agree
7	Poor data transmission	141	192	111	6	3.04	0.78	Agree
8	Inadequate telecommunication infrastructure around campus	162	117	153	18	2.94	0.93	Agree

Table 5 shows that the major challenges affecting the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web are Erratic electric power supply, with 3.78 mean score; High cost of Internet access through data subscription, with 3.64 mean score; Lack of search skills, with 3.64 mean score. The least factor is Inadequate telecommunication infrastructure around campus, with 2.94 mean score.

Table 6: Mean Responses on the strategies to enhance the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web.

S/N	Items	SA	A	D	SD	Mean	St. D	Decision
1	Subsidizing the cost of acquiring personal computer or smartphone for students	282	159	9	0	3.61	0.53	Strongly Agree
2	Provision of high Internet connectivity	297	126	27	0	3.60	0.60	Strongly Agree
3	Students should adopt Techno-stressed management strategies	333	72	18	27	3.58	0.83	Strongly Agree
4	High data transmission	252	198	0	0	3.56	0.50	Strongly Agree
5	Provision of adequate telecommunication infrastructure around campus	288	117	45	0	3.54	0.67	Strongly Agree
6	Provision of constant electric power supply	243	198	9	0	3.52	0.54	Strongly Agree
7	Subsidize the cost of Internet access through data subscription	225	180	27	18	3.36	0.77	Agree
8	Training students on acquiring adequate search skills	198	199	44	9	3.30	0.73	Agree

Table 6 shows that the major strategies to enhance the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web are Subsidizing the cost of acquiring personal computer or smartphone for students, 3.61 mean score; Provision of high Internet connectivity, with 3.60 mean score; Students should adopt Techno-stressed management strategies, with 3.58 mean score; High data transmission, with 3.56 mean score. The least strategy is Training students on acquiring adequate search skills, with 3.30 mean score.

Discussion of Findings

The findings revealed that, undergraduate students have high level of awareness of google, low level of awareness of Google scholar, Bing and Yahoo, While the undergraduates has no awareness of Yandex, DuckDuckGo, AOL, MSN, Altavista, Infospace, Ask.com, Naver, and Lycos, The finding is in accordance with that, according to Daniel and Oghale (2015) awareness

is a necessity to the usage of search engines. For an individual or student to participate in any work or activities, awareness about the environment, how things are done and should be done is very important. Adams (2013) further explained that students have very confused understanding of various search engines and its concept. More so, many students are not yet involved with various search engines.

The findings revealed that, the extent of utilization of google is very high among undergraduates for information retrieval, while the extent of utilization of Google scholar, Yahoo, Bing, and Dogpile is low. While Yandex, DuckDuckGo, AOL, MSN, Altavista, Infospace, Ask.com, Naver, Lycos are utilized to a very low extent among undergraduates for information retrieval. This might be due to low awareness of these search engines among the students. The finding is in accordance with that of Shearer (2012) who noted that the use of the various search engines is very low, except for Google. Also with that of Ogbole (2017) findings revealed that the most famous search engines were Google and yahoo. And Imoniwe (2018) who found out that, Undergraduate Students level of awareness of search engines was low in Delta State University. The findings also validates that of Ozonuwe, Nwaogu, Ifijeh and fagbhun (2018) who stated that, they were mostly aware so the advanced search options of Google (their most preferred engines)

The findings revealed that the extent of awareness and utilization of Internet search engine contribute greatly to effective information retrieval on the web among undergraduate students of Nigerian Universities. The respondents strongly agreed that, the awareness of some Internet search helps me to meet my information need, Utilization of Internet search engine has reduced the time I spend to find information doing my academic work, awareness and utilization of Internet improved in the retrieval of adequate information from the web, and using advance search on internet search engine has helped the students to retrieve high quality research papers. This finding corresponds with that of Ogbole (2017) whose earlier study found out that Utilization of internet search engine has the potential of improving access to current information resources online with little cost.

The findings revealed that, the major challenges affecting the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web are erratic electric power supply, high cost of internet access through data subscription, lack of search skills, slow internet connectivity, lack of fund to acquire personal computer or smartphone, techno-stressed, poor data transmission, and inadequate

telecommunication infrastructure around campus. The finding is in agreement with that of Daniel and Palmer (2015) who found out that information overload was the greatest challenge the undergraduate students encountered, followed by erratic electric power supply, high cost of internet access through data subscription, lack of search skills, slow internet connectivity, lack of fund to acquire personal computer or smartphone, techno-stressed, poor data transmission, and inadequate telecommunication infrastructure around campus

The findings revealed that, the major strategies to enhance the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web are subsidizing the cost of acquiring personal computer or smartphone for students, provision of high internet connectivity, students should adopt techno-stressed management strategies, high data transmission, provision of adequate telecommunication infrastructure around campus, provision of constant electric power supply, and subsidize the cost of internet access through data subscription. The finding is in accordance with that of Ogbole (2017) who recommended that Librarians should provide knowledge about different online search engines to undergraduate students and not just Google and Yahoo through user education. Also, Webmasters should advertise the other online search engines online so as to increase knowledge and patronage to them. Ozonuwe, Nwaogu, Ifijeh and fagbhun (2018) recommended that university authority should work at increasing bandwidth this will help to boost the speed of the internet browsers and enhance the use of search engines.

Conclusion

The study examined the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web. Based on the findings, the study concluded that, undergraduate students have low level of most of the internet search engines except google, Google scholar, yahoo and Bing. Also most of the students utilizes only google to a high extent, then few utilizes Google scholar, yahoo and Bing. The study concluded that the extent of awareness and utilization of internet search engine contributes greatly to information access and retrieval among undergraduates in Nigerian universities. It was also concluded that, the major challenges affecting the awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web are erratic electric power supply, high cost of internet

access through data subscription, lack of search skills, slow internet connectivity, lack of fund to acquire personal computer or smartphone, techno-stressed, poor data transmission, and inadequate telecommunication infrastructure around campus. Finally, the study concluded that, the major strategies to enhance the level of awareness and utilization of internet search engine among undergraduate students of Nigerian Universities for Effective Information Retrieval on the web are subsidizing the cost of acquiring personal computer or smartphone for students, provision of high internet connectivity, students should adopt techno-stressed management strategies, high data transmission, provision of adequate telecommunication infrastructure around campus, provision of constant electric power supply, and subsidize the cost of internet access through data subscription.

Recommendations

The following recommendations were suggested:

1. Adequate awareness of other internet search engines should be created among undergraduates. Most especially specialized search engine like google scholar and others.
2. Undergraduates should be enlightened and encouraged through library user education to always utilize internet search engines for effective information retrieval.
3. The university management should try to subsidize the cost of acquiring personal computer or smartphone for students by granting them loan or providing the system for students to pay in installment
4. The university management should try to Provide high Internet connectivity
5. Adequate telecommunication infrastructure should be provided around the university campus
6. Electric power supply should be made available for students around the university campus and most especially in hostels for students to charge their devices

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