Usage of Internet Search Engines among Polytechnic Students

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***Abstract*: The internet has emerged as a versatile information repository tool that offers immense potential in optimizing the transactional dynamics of teaching and learning. In the context of a developing country such as Nigeria, the Internet is an ubiquitous fixture in the ever expanding electronic learning landscape of the educational system. Hardware infrastructures are in place in schools in Nigeria to enable them to be seamlessly connected to the Internet to tap the wide array of opportunities the Internet affords in providing a digital context of learning that extends cognitive apprenticeship from theoretical settings to applied, active instructional environments. However, having widespread access to Internet technologies doesn't translate to automatic positive learning gains. The power of technology needs to be combined with the expertise of pedagogy to form a potent partnership that elevates the quality of instructional delivery. This concern becomes particularly problematic when critical information literacy skills underpinning the success of Internet-based learning initiatives are self or peer taught, as it often happens in Nigeria. Information literacy skills are too complex and diverse to be able to be readily learned through self-taught modes of knowledge acquisition by young learners. The baseline study elaborated in this presentation attempts to document the Internet information search proficiencies of a sample of polytechnic students in Nigeria to underscore the importance of systematic, intentional integration of information literacy skills within formal curriculum in schools.**

***Keywords*;- Internet, Search engine, Polytechnic, Students, Nigeria**

I. INTRODUCTION.

Web Search Engine is a software program that searches the Internet (bunch of websites) based on the words that you designate as search terms (query words). Search engines look through their own databases of information in order to find what it is that you are looking for. Web Search Engines are a good example for massively sized Information Retrieval Systems [1], Also, search engines are programs that search documents for specified keywords and returns a list of the documents where the keywords were found. A search engine is really a general class of programs, however, the term is often used to specifically describe systems like Google, Bing and Yahoo! Search that enable users to search for documents on the World Wide Web. There are many search engines available on the web, the searching methods and the engines need to go a long way for efficient retrieval of information on relevant topics. None of the search engines out there today are perfect, but using the right one at the right time can make all the difference. It should be noted that Search engines need valuable websites to display in their organic search results so they can earn money from paid searches [1]. The usefulness of a search engine depends on the relevance of the result set it gives back. While there may be millions of web pages that include a particular word or phrase, some pages may be more relevant, popular, or authoritative than others [2].

In the context of a developing country such as Nigeria, the Internet is an important fixture in the ever expanding electronic learning landscape of the educational system. The internet has been known to house all forms of information from all walks of life but this wealth of information is only available to those who have the means to access them. These means include internet connectivity on one hand and a proper proficient search engine on the other hand. Search engines can be used with small collections, such as a few hundred emails and documents on a desktop, or extremely large collections, such as the entire Web. There may be only a few users of a given application, or many thousands. Scalability is clearly an important issue for search engine design. Designs that work for a given application should continue to work as the amount of data and the number of users grows. This means that many different aspects of the search engine, such as the ranking algorithm, the interface, or the indexing strategy, must be able to be tuned and adapted to the requirements of the application [3]. Since they came into existence on the Web in 1993, Web search engines have been very successful and growing at a very fast speed. Now they are used by billions of people all over the world. During the last two decades, change has been the only constant: new Web search engines have come into existence as some others have faded away.

A fairly substantial body of research has been given to evaluation of the effectiveness of Web search engines employing a range of metrics in [4], [5], [6], [7], to the best of our knowledge, no study has yet been done on the evaluation of the Usage of internet search engines by the Polytechnic students.

The necessity of the study is to present the importance of search engines to education especially among students of higher institution with polytechnic students in view, this study was carried out to know how much polytechnic students are conversant with the internet. Students can locate informational

resources on the Web by either going directly to a target website, if known or using a search tool [8]. To facilitate the process of searching for information in the Internet, the Internet itself offers various search tools.

Nigerian polytechnic students has been maximizing this laudable internet opportunity for a while now in areas of knowledge acquisition, assignments, reports, papers, projects, news, socializing and so on. This is due to the fact that timely information retrieval and use are critical factors in ensuring success in learning and the Internet is undoubtedly the largest digital information repository hosting information that is immediately and easily accessible.

The use of the internet to search information has been the most important use of the internet to Nigerian polytechnic students, thus the need for search engines. This paper tried to measure the knowledge of polytechnic students about the internet in addition to realizing and recognizing the usage of internet search engines among polytechnic students. In this study we shall consider the following:

a. how conversant is Nigerian Polytechnic Student with the internet?
b. analyze the usage of search engines by Nigeria Polytechnic Students to solve problems
c. know the level of awareness of search engines among the students
d. know the search engines that are mostly used by the polytechnic students

II. FEATURES OF WEB BASED SEARCH ENGINES

Following are the basic features for evaluating web based search engine [9].

a. Web Indexes-When a web search request is generated. It is the web index generated by web robots or spiders. The combination of web indexes affects the performance of a web search engine. Three main key points to design of web index are coverage, update frequency and the part of indexed web page.
b. Search Capability-Search Engine must provide Phrase searching, truncation Search capacity finds its Performance efficiency, throughput.
c. Retrieval Issue -This issue proceed on three Key points- Precision, Recall and response time.
d. Write Option-Write option or output option provides the deal with actual content of output.
e. User effort -User effort means the documentation and interface. Good prepared documentation and good interface play a different role in users' selection of web search engine. User will only use the search engine when the interface is user friendly only.

III. ADVANTAGES OF SEARCH ENGINES.

Search engines can scan millions of web pages in a very short while making it very easy for you to access a lot of sites in a matter of seconds. The advantages of using the search engine for your research or personal work include:

a. Time saving: The search engines help you to save a lot of time by bringing many websites together at once, eliminating the need for you to search the different sites/web pages one at a time. It makes work faster by doing searches at very high speed.
b. Relevance: Most search engines often search for related or relevant information to your search words making it more useful by sorting it in descending order and the most relevant being displayed first
c. Comprehensive: The search engine searches through millions of websites always keeping record of all the data they visit each time. This makes it a good source for comprehensive data or enquiries being sought or unsought for.
d. Advanced search: Apart from keywords, search engines allow you use advanced search options to refine your results. These options help make your searches more flexible and sophisticated. For example, some search engines allows you to use special characters such as double quotes " "" ", minus sign " - ", asterisk " * "etc. for advanced search and this bring better results,
e. Free Access: Search engines like Google, Bing, yahoo and some others allow searches on their search engines for free though there are some others that need you to make payment before you can use their sites.

IV. LITERATURE REVIEW

The Internet is a vital informational and educational medium. The Internet is an extensive system of interlinked yet independent computer networks connecting millions of computers together globally [10]. This worldwide network of networks consists of a set of rules that allows computers to connect and communicate with other computers as long as they are connected to the Internet. The Internet has in recent times emerged as the most vital and powerful digital information medium to shape and define the educational field.

Provision of tools for inquiry [11] argues that the Internet provides tools for active educational inquiry. By enabling students' access to resources from the outside world, including experts in the field and direct collaboration with them, the Internet enhances students' knowledge construction. Thus, exposure to real life contexts trains students to face the uncertainties of the ever-changing outside world [12]. It should be noted that, students who are not versatile in the use of Internet might not have the necessary skills to function effectively in the use of the technology when they graduate. It becomes inherently vital that students be trained to become proficient users of the Internet. Skills are important for the effective use of the Internet. Today, traditional societies are being transformed into knowledge societies all over the world[13]. Therefore, in the knowledge based societies of today, meaningfully searching for and retrieving a wide

spread of comprehensive information from the Web has critical importance. Effective use of the Internet to glean relevant information requires the ability to apply Boolean logic rules and an understanding of how information is organized - critical thinking skills that allow the searcher to make informed choices and acquire a working knowledge of Internet functions.

Effective Googling through different types of search engines: articles/papers; books; images; statistics; datasets; by discipline, etc., Portal/Gateway sites; custom search engines, Usage of Google to locate "type"-based resources (e.g. a directory, bibliography, database, open access repository) and evaluating websites is presented in [14]. Attention was given to the usage of Google search elaborately.

Other necessary skills involved are general knowledge about the subject of the search, specific prior knowledge of the topics being scrutinized, narrowing and expanding topics, appropriating certain language capabilities and recognizing usefulness of information [7], [15] advocated that Web navigation entails integration of cognitive abilities such as searching for information, scanning and skimming information and meta cognitive strategies such as planning, monitoring and evaluating.

People search the Web for many things, including shopping, sex and information on a near infinite array of topics. Major focuses of people's lives are other people and communicating with other people. The Web now provides another source of information about people from every country of the world. Ordinary people and celebrities can use the Internet to distribute and seek information. For example, some Web services (e.g. www.classmates.com) provide a way of connecting with your former high school classmates. People also use list serves, chat rooms and e-mail to

communicate constantly with each other (e.g. Yahoo! groups). [16]. Seeking information on other people is also a key activity in the business and intelligence world [17].

A Large discrepancy on how different search engines disseminate information about the COVID-19 pandemic was identified in [18]. Some differences in the results are expected given that search engines personalize their services [19], but their study highlights that even non-personalized search results differ substantially. For example, they found that some search algorithms potentially prioritize misleading sources of information, such as alternative media and social media content in the case of Yandex, while others prioritize authoritative sources (e.g., government-related pages), such as in the case of Google. They found that the degree of randomization varies between the engines: for some, such as Google and Bing, it mostly affects the composition of the "long tail" of search results, such as those below the top 10results, while others, such as DuckDuckGo and Yandex, also randomize the top 10 results.

However, criticism of algorithmic non-transparency in information distribution is not new [20], [21], lack of transparency is particularly troublesome in times of emergency when the biases of filtering and ranking mechanisms become a matter of public health and national security. Their observations show that search engines retrieve inconsistent and sometime misleading results in relation to COVID-19, but it remains unclear what factors contribute to these information discrepancies and what principles each engine uses to construct hierarchies of knowledge.

The effectiveness of Web search engines on results diversification was done manually by [22]. The analysis focus on the three major Web search engines: Google, Bing and Ask using 200 multi-faceted or ambiguous queries from TREC by classical metrics and intent-aware metrics. The experimental results show that on average Bing and Google are comparable and Ask is slightly worse than the former two. However, Ask does very well in one subtype of queries – ambiguous queries. The average performance of the three search engines is better than the average of the top two runs submitted to the TREC web diversity task in 2009-2012. Generally, all three Web search engines do well, this indicates that all of them must use state-of-the-art technology to support the diversification of search results.

Social search engines can also be devised using the output of social tagging systems such as delicious (delicious.com). Social search also encompasses active requests for help from the searcher to other people. [23] describe the stages of the search process when people tend to interact with others. A well-studied type of social searching behavior is the posting of a question to a Q&A site [24] where other users (typically not known personally to the asker) can offer answers.

V. METHODOLOGY

The research site for this study was the Federal Polytechnic Ede, Osun State. The source of data was based on primary data. A questionnaire was designed and distributed on a purposive sample of Higher National Diploma (HND II)Computer Science students at the Federal Polytechnic Ede. This study was conducted in the second semester of 2019-2020 academic year. The participants of this study came from a class of 48 final-year students. The students in the class range in ages from 22 to 28 and were evenly mixed in terms of gender distribution. The analysis of the data was a structured survey. The survey consisting of nine close-ended questions was administered to students to determine the levels of Internet information search literacy skills and development among the selected students during one of their regular classes. The survey addressed areas of students' conceptions about the Internet and the strategies they adopted during their periods of engagement with the Internet in search of educational information materials.

VI. RESEARCH FINDINGS AND DATA ANALYSIS.

Table 1. Evaluation Of The Data

Sn	Question	Yes	No	Total
1	Do you know how to operate a computer?	48	0	48
2	Do you own a computer?	48	0	48
3	Do you have knowledge of search tools?	48	0	48
4	Do you use multiple search engines in searching for your information?	12	36	48
5	What are your preferences in using search engines?			
	Google	31		
	Bing	1		
	Yahoo	4		
	Baidu	0		
	AOL	4		
	Ask.com	1		
	Excite	1		
	DuckDuckGo	0		
	Wolfram Alpha	0		
	Yandex	0		
	Total for Sn 5	48		

Reference Table 1 and Figure 1, the analysis of the data is presented below:

A. Question 1

The first question that was posed in the survey was "Do you know how to operate a computer?" This introductory question was meant to evaluate students' comfort levels in basically using the computer. This question would provide evidence supporting the key presupposition that Nigeria Polytechnic Students are indeed largely left to their own independent devices in learning Internet information search skills. These skills are not intuitive and are not easily picked up through self-directed learning or peer-tutoring.

All the forty-eight students mentioned that they all know how to operate a computer.

B. Question 2

In response to the second question of the survey on if they own a computer, they all replied yes because each of them own either a laptop system or desktop computer system.

C. Question 3

The third question queried on students' knowledge of search tools and the reasons behind their choice of search tools in carrying out their information searching. All the surveyed students specified search engines as the common search tools they frequently access. Effective users of Internet information must first be effective searchers in trying to locate information found in the Web. Generally, students' responses to this question were brief, shallow and superficial, without delving into the specific details of whichsearch engines best handle queries on particular information subjects and topics. Some of the explanations proffered by students contained misconceptions or were driven by popular choices and conveniences of access.

D. Question 4.

"Do you use multiple search engines in doing your information searching?" The objective of this question was to investigate students' familiarity with the plethora of available search engines and their awareness of which of these search engines best suited their contextual needs. Significantly, twelve students responded that they use only one search engine to carry out their information searches. These students did not realize that one single search engine would not fully satisfy in entirety all their information needs. Search engines can be differentiated by the search algorithms they employ to perform their searches and each search engine has its own strengths and weaknesses. Furthermore, certain search engines specialize in focusing their search interests on specific areas of expertise. The choice of use of a particular search engine is determined by the parameters of the information requirements. Generally, accessing multiple search engines would be a more advisable technique since the information output would be more comprehensive, with a greater degree of success in finding relevant, cross-referenced information. Of greater concern were some of the misconceptions that surfaced in attempts by students at justifying the use of one search engine to execute their searches. For example, one student argued that "I believe that not many people can multi-task and handle the complexities of various search engines. Personally, I usually use Yahoo! since I think it is the best and serves all my needs." The remaining thirteen students gave the feedback that they usually use multiple search engines in performing their Internet information searching. Though, there evidently was a lack of depth in the explanations provided by the students on the underpinning reasons for their use of multiple search engines, at least, at a fundamental level, they were able to recognize the benefits of leveraging upon multiple search engines. Though these students cannot be considered as expert Internet searchers, the ubiquitous availability of computers and Internet access, both at home and in school, has undoubtedly acquainted students with a basic overview of the structure of the Internet and the common search tools it offers.

E. Question 5

This question probed the students' patterns of preferences in using search engines and their supporting reasons. Not surprisingly, a majority of the students i.e. Nine students mentioned Yahoo! and another thirty-one students stated

Google. Google and Yahoo! have been found to be the two most popular choices of search engines amongst all Internet users.

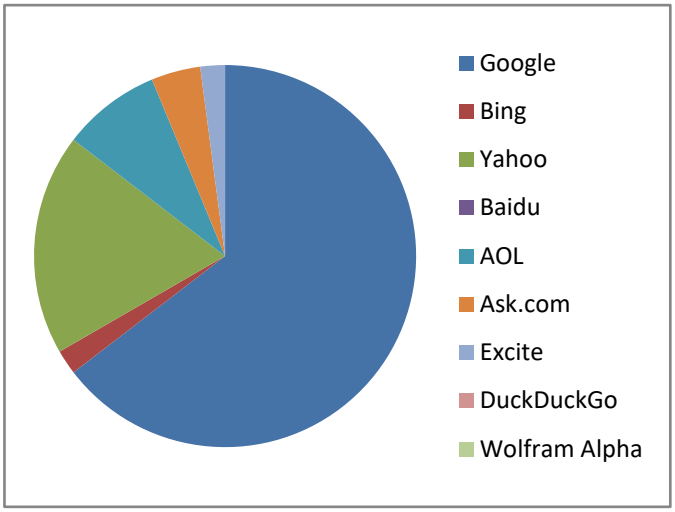

Fig. 1: Pictorial analysis of the data

VII. FINDINGS AND CONCLUSION

The findings of this study emphasize the cognitive complexity of Internet information literacy skills, the learning of which is non-trivial to be left to students' own independent devices. Due to the extensive exposure they receive on a daily basis through their interactions with the Internet both in and outside school, students in Nigeria are largely familiar with the Internet interface and the multiplicity of tools it offers. However, it was found in this study that students generally seemed to lack fluency in the core 'soft' skills of information literacy to structure learning to become more focused, engaged and productive. They were also not well acquainted with the broad repertoire of information search strategies and techniques that would enable them to plan for and execute their information search actions in efficient and efficacious ways. This was primarily due to the fact that there are currently no mandatory programs in Nigeria schools during formal curricular hours specifically aimed at intentionally training students to become information literate. Hence, students generally were deficient in their understanding of the search capabilities of the Internet to be able to fully exploit the educational computing potential of the Internet in fostering dynamic, independent learning environments.

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