

# Comparative Analysis of Search Engine Usage, Relevance and Effectiveness among Final Year Undergraduate Students

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**Abstract**— Globally, final year undergraduate students in universities carry out project reports as part of requirements for graduation. However, for meaningful project to be done in this era of Information and Communication Technology, there is need for them to make use of search engines which is synonymous today with Google in some clime. This paper examines the use of Web search engines by final year students to support learning and research in a Nigerian University. The frequency of usage of search engines, their level of satisfaction with search results, the effectiveness of the search engines as well as the relevance of results obtained by various search engines were investigated. The results showed that Google search engine was adjudged the best with highest frequency of usage and result retrieval outcome. Result from chi square test indicates that there is no significant relationship between gender, schools and relevance of results returned by the search engines

**Keywords**- Search engines, Final year students, gender, results, usage, Nigeria.

## I. INTRODUCTION

Educational system in Nigeria has undergone a lot of transformation in the past years. The system being adopted for many years is known as the 6-3-3-4 system whereby students spend six years in primary school, three years each in junior secondary and senior secondary schools respectively and then four years in tertiary institutions. However, this was reviewed of recent to 9-3-4 system and later 1-6-3-3-4 system was introduced. The difference being that a one year pre primary school was introduced. The system introduced notwithstanding, the final destination is still tertiary institution which is mostly four years depending on the type of course being studied.

With the advent of the Internet, there have a lot of transformation in the academic landscape in the education sector globally and in Nigeria as well . This is because there is availability of search engines and other tools that aid teaching, research and learning. As observed by [16], there

are millions of Web users and about 85% of them use search engines to locate information on the Web. Search engine use has been found to be the second most popular Internet activity next to e-mail [24]. Due to high demand there are hundreds of general purpose and thousands of specialized search engines on the Internet today.

Therefore, the use of search engines among students in institutions of higher learning globally has as well grown by leaps and bounds and it is still on the increase. More importantly, Nigerian final year undergraduate students are strategically positioned in the higher institution of learning because, at that level they are expected to carry out research project that will qualify them for graduation. As a result, their usage of search engines to get relevant materials for their project is very vital.

More so, the quality of their project work is determined by the quality of the resources consulted and cited in the course of writing. So it is not uncommon to hear the phrase “Google it” being used commonly among students. This shows that the use of web search engines has indirectly taken over the traditional library in information seeking and searching. Previous research studies focusing on undergraduate and post graduates students in general have been conducted in various field with little or none focusing on final year students alone ([1] [2][3][4][5][6][7][8]). Hence, there is there is need to focus only on final year students using Nigeria as a case study.

The need for users to find information as well as services available on the web is ever growing. Search engine usage is said to be the second most common web activity after email [13]. It is affirmed that search engines have become the most important tool for our information seeking [14]. Due to their tremendous economic value, search engine companies constantly put major efforts to improve their search results. User satisfaction with a particular search engine can only be measured using queries from the user’s daily information needs and based on his/her personal assessment of utility of

the returned results to the queries. An ideal evaluation is a personal evaluation [5].

The reasons why a user might choose one search engine over another are complex but elements such as speed, ergonomics and aesthetics all come into play. Moreover, the most important criterion seems to be that of the relevance of the results to the search performed, at least in the way they are perceived as relevant by the user [6].

This study compares search engines usage, effectiveness and relevance of results obtained by final year students of the Federal University of Technology Minna in the course carrying out project work. The study will provide answers to questions such as how frequent do final year students use search engines for research? Which search engine do they use most? What is the effectiveness of the search engines used by them? What are the reasons for the preference of search engine?

Two hypotheses are formulated for this research:

1)  $H_1$ : There is significant relationship between the gender of students and relevance of results obtained by search engines .

2)  $H_2$ : There is significant relationship between students from different faculties and the relevance of search results obtained from the search engines.

### III. REVIEW OF RELATED STUDIES

Search engine according to [23] “is a computer program that acts as a way of retrieving information from a database, based on certain criteria defined by the user”. Modern search engines work by searching databases that contain huge amounts of data. This data is collected from the World Wide Web, newsgroups, and directory projects. The evolution of the search engine was rather quick, with the earliest true search engine appearing at the beginning of the 1990s, and the first modern-style search engine appearing in 1995 [23].

Several studies on search engines have been conducted. Some of these related studies on search engines are discussed as follows.

Reference[1] in her study on information seeking behavior of final year law student in south western Nigeria University discovered that Google, Wikipedia and Ask.com are the three most popular used information channels with Google taking the lead. The result was obtained from both interview and questionnaire distributed for the purpose of the study. From another study on comparative analysis on six search engines which include three English search engines; Google, Yahoo, MSN and three French search engines; Exalead, Voila and Dir.com [6]. The relevance of search results produced by the search engines using French language was determined. Fourteen first year Students were used for the study. Results from the study showed that Google and Yahoo were the best search engines even though the pass grade was average.

A survey on five major search engines (Google, Yahoo!, MSN, Seekport and Ask.com) was conducted by [7]. This is to know their retrieval effectiveness. Both the results and the results of the description were taken into account. It was discovered that Google and Yahoo performed best and there was no significant differences between them.

A comparative study on some popular websites was carried out by [18] so as to determine their effectiveness based on its content, response time. The study was based on measures such as search output quantity, search time, relevant documents retrieved, search precision and the quantity of African contents in the search. It was discovered that Google, MSN and Yahoo search engines have high document quantity retrieval capacity with low response time but their effectiveness (precision) in retrieving relevant documents is very low. Also, it was discovered that they are good avenues for advertisement on the site. The study concluded that, though a Web search engine is very popular and able to retrieve large number of documents. That does not mean that it has high precision for retrieving relevant documents for its users.

In a study by [8] on the use of search engines by post graduate students, it was discovered that most post graduate students are only exposed to Google and Yahoo search engines. Further result indicated that many of the students are not very much exposed or even aware of any other various search engines available on the Internet. In another study conducted by [19] to investigate the use of overseas search engines by the UK academic community. AltaVista was found to be most frequently used followed by Yahoo and Lycos respectively. The reason for their usage according to the authors was based on the speed of access to information, and the volume of information perceived by the users to be stored in the search engine repository.

Reference [5] carried out a comparative study on three search engines to know which best meet users need. It was found that Yahoo obtained the highest results among the three Web search engines tested. This was followed by Google and ask.com .

Another research conducted by [2] rated Google (83.3%) as the most preferred search engines by the users. Yahoo, Alta Vista and Lycos followed with 22.7%, 13.6% and 7.6% respectively. The preference towards Google was as a result of its effectiveness as well as the simplicity of its interface. Similarly, [25] in their paper on internet use among undergraduate, graduate and post graduate students in university of Punjab affirmed that Google which score 90% was the most popular search engine among them. Yahoo, MSN, Alta Vista have 44%, 22% and 10% of users respectively. The major reasons for the preference being ease of use, time saving and availability of searching tools

Further more, [9] conducted a study to know the most popular search engines among students of Near East University, Cyprus. They found out that Google was most popular while other search engines were not even known by most students. Reference [4] in his paper also examined the

use of internet by students and faculty to support learning, teaching and research. It was discovered that there was overall satisfaction with search engines especially Google. More so, most users prefer Google search engine than others. Reference [24] in their study also observed that Google was the preferred search engine among faculty.

In another study conducted by [22] aimed at knowing the impact of the internet on final year students' research. It was discovered that most of the students used Google (40%) as their search engine. The next search engines highly used by students were Yahoo (28%) and MSN (14%). Other search engines were used minimally as discovered in the study.

From a survey that was carried out by pew Internet and American in 2012 to survey search engine usage among adults. It was discovered Google is far and away the search engine of choice, preferred by 83% of the search users, while Yahoo is a very distant second at just 6%.

From the review above, there is limited research on internet search engines usage with special focus on final year undergraduate students. Also, effects of gender as well as faculty on relevant of search results have not been fully researched. Considering the importance of these set of students and their dependence on search engines for research, it is very important to consider a study like this.

#### IV. METHODOLOGY

The research was conducted in Federal University of Technology, Minna. Multistage sampling technique was employed. Initially, two schools (faculties) out the existing five schools then were selected. Then five departments were randomly chosen from the fifteen departments in the two schools. Thereafter, the population of the study which comprises two hundred and fifty final year students was randomly selected from the departments. The selection of the department was done such that those whose students must frequently use the internet were chosen. So, priority was given to Information Technology related departments. A total of two hundred and fifty copies of questionnaires were administered out of which two hundred were returned.

The research instrument adopted for data collection of the study is a structured questionnaire. The questionnaire contains four sections. Section A captures personal information of the respondent. Section B, C and D contains questions to know the effectiveness, relevance and the frequency of use of the search engines respectively.

The questionnaire was constructed in a way to elicit necessary data pertinent to some of the research questions and objectives of the study. The questionnaire was refined and later reconstructed and modified by the researcher in consultation with some experts with some other necessary factors to validate the research instrument. The questionnaire was designed in a tabular form to help the respondent for easy understanding and response. The

returned questionnaires administered were duly filled and returned.

#### V. RESULTS AND FINDINGS

Statistical Package for the Social Sciences (SPSS) was used to analyse the data using frequency, mean, standard deviation, chi square and percentage methods. Mean difference is categorized from 1 to 5 for no opinion to very often, 1 to 4 for no opinion to very effective, and 1 to 4 for no opinion to very relevant to know the usage frequency, effectiveness and relevance of the search engines respectively. Tables 1 shows the demographic data of the respondents

Table 1: Demographic data of the participants

Variable	Item	freq	perc
Gender	Male	110	55
	Female	90	45
Faculty	Science	133	66.5
	Engineering	67	33.5
Internet Experience	Below 1 yr	46	23
	2-5 yrs	74	37
	Above 5yrs	80	40

Fig 1 shows the frequency of usage of different search engines where VO= Very often, O=Often, R=Rarely, NA=Not At All and NR= No Response. From the results obtained, Google was as being most often used search engine with 83% (166) of the respondent agreeing to that. Yahoo is rated second with 50% (100), MSN is rated 17% (34). On the other hand, 61.5%, 56.5% and 54.5% of the students do not use Netscape, Lycos and AOL respectively

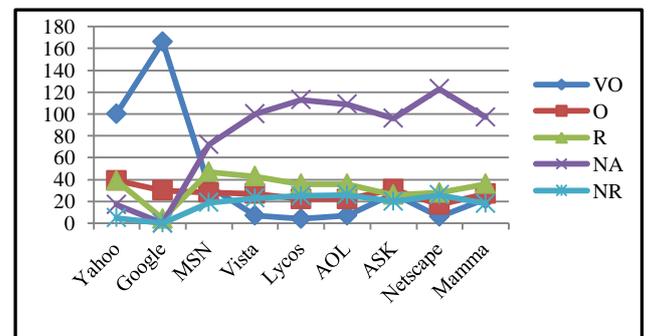


Fig 1: Frequency of usage of Search Engines

at all. This shows that most students use Google while some others were not in use at all. This is conformity from previous researches ([6][17][18][2][9][12] which put Google as the lead search engine in term of frequency of usage.

From Fig 2, the effectiveness of the results obtained from different search engines is depicted. 83.5% and 53.5% of the respondents agreed that Google and yahoo are very effective, while 36%, 12%, 10%, 19%, 36%, 7% and 35% agreed that MSDN, AltaVista, Lycos, AOL, Ask, Netscape and Mamman are effective respectively. This is also in agreement with [4] [12]. This measure takes into consideration the ease and speed of retrieving information from the search engines.

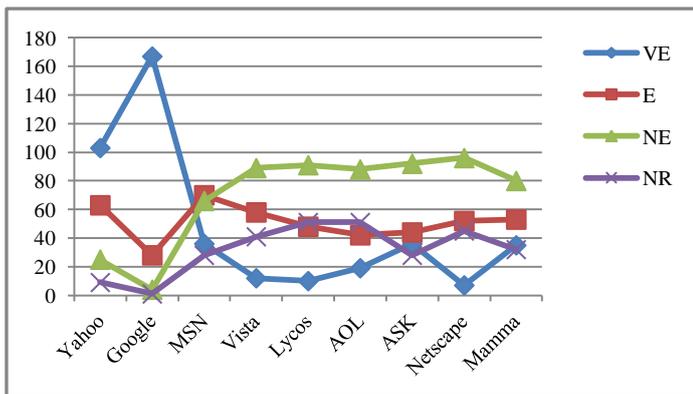


Fig 2: Effectiveness of the Search Engines  
Where VE=Very Effective, E=Effective, NE=Not Effective and NR=No Opinion

Fig 3 shows the relevance of document retrieved from the search engines. From the figure, 97.5% of Google users agree that very relevant and relevant results are obtained from search conducted. 86.5% of Yahoo! Users also believed that very relevant and relevant results are obtained. MSDN has 51% or relevant results obtained while the remaining search engines have below 50%.

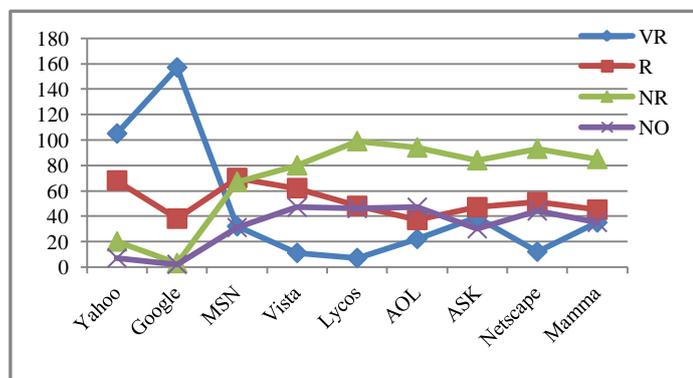


Fig 3:Relevance of Documents Retrieved

Where VR-Very relevant, R-Relevant, NR-Not relevant, NO-No Opinion

So, most of the students are satisfied with the results they obtained from the search engines.

In order to know the effect of variables gender and faculty of the student on the relevance search results obtained, two hypotheses were formulated. Hence, chi square test was carried out on the data. The results of chi square are shown in Table 2 and Table 3 for H<sub>1</sub> and H<sub>2</sub> respectively.

From table 2, a chi square test was performed for H<sub>1</sub>,  $\chi^2(3, N=200) = 7.06, p=.070$ . Therefore, the research hypothesis H<sub>1</sub> is rejected and null hypothesis is accepted. So, there is no relationship that exists between gender and the relevance of results obtained. Also, from table 3,  $\chi^2(3, N=200)=4.53, p=0.21$ . Hence,  $p > 0.05$ , this also show that  $p > 0.05$ , we also reject the research hypothesis, H<sub>2</sub>, and accept the null hypothesis. This implies that there is no relationship that exists between schools (faculties) of students and relevance of results obtained.

Table 2: chi square test result for H<sub>1</sub>

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.056	3	.070
Likelihood Ratio	6.720	3	.081
Linear-by-Linear Association	6.372	1	.012
N of Valid Cases	200		

Table 3: Chi square test for H<sub>2</sub>

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.532	3	.209
Likelihood Ratio	4.554	3	.208
Linear-by-Linear Association	.212	1	.645
N of Valid Cases	200		

## VI. CONCLUSION

The role played by search engines in assisting students during the course of writing project has been shown to be very crucial in this research. It is clearly observed from the study that there is domination of Google as the preferred search engines among final year students. It was discovered that students who prefer Google only use Google and hardly try any other engine. In the same vein students who prefer Yahoo! Only use Yahoo! and hardly try any other and so on. They usually use the same one or several search engines for all their searches regardless of the type of information being sought. Also, Yahoo search engine though a directory is also gaining popularity as against it's often use as email

services. However, the other search engines are also available but not very many students are using them.

Furthermore, it seems hard to evaluate which search engine is the best because it is really just a matter of opinion. However, our research ascertained that Google surpasses all other search engines and is the most widely used among students because of its effectiveness, efficiency and relevancy of the search results to their search queries and information needs. It has also been shown from the study that gender and school (faculty) of the students have no effect on the relevance of the results obtained from the search engines.

Based on the findings of the study, the following recommendations are hereby made to help students in their choice of search engine and in formulating a better search queries that will give them desired and satisfactory results:

One, Students should endeavor to use several search engines for a particular search query and compare the results than using the same search engine over and over. Two, internet users generally should acquaint themselves with the advanced search feature on several engines for better query formulation and result retrieval. Three, there should be frequent update of databases of web pages so that outdated information would be replaced with recent information. This will eventually lead to having more relevant results retrieved by the users.

Finally, according to our findings majority of the students believe that speed, relevancy, and effectiveness definitely affects which search engines they would choose to use; there is a need for the search engine developers and marketers to really enhance these factors.

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