

User Perceptions on Search Engines and their impact: A study with Special Reference to some Selected Universities of Kenya

Ronald Bituka

Abstract

This paper examines the User Perceptions on Search Engines: A study with Special Reference to some Selected Universities of Kenya. Although there are variations in search engine use among the faculty surveyed, there is convergence in means of overall satisfaction with the outcomes of their searches and trust in search engines in supporting their teaching and research. Based on Interface preference, Google is the preferred search engine interface for most participants, followed by Yahoo! and Bing.

Key words: search engines, interfaces, design, Google, Yahoo, Bing

Introduction

Search engines being the programs which enable users to retrieve information from the Web, they have become an integral part of our information environment hence, they are increasingly replacing the role of libraries in facilitating information discovery and access finding information. Google has become synonymous with research (Mostafa, 2005) (Griffiths and Brophy, 2005). This study explores the search engine experiences of faculty as they seek information to support their teaching and research and offers a holistic perspective by examining use behaviors within the context of supported processes and expected outcomes within an academic environment.

Objectives of the study

1. To know user's awareness level of search engines,
2. To know user's perceived level of prior knowledge and experience in using search engines,
3. To know user's perceived level of satisfaction with search engines in terms of satisfaction for search retrieved results and search engine response time,
4. To know the impact of using search engines by the users.

Related studies

Lazonder et al. (2000) point out that in this digital environment, users' prior knowledge and experience in using search engines can influence their web search interaction and their perceived level of satisfaction as revealed by their study that user with Web search experience are more proficient in locating information on the web than their novice peers. The observed differences were credited to the experts' superior skills in operating web search engines. The study also suggested that there is a good correlation between level of expertise and degree of search success.

Ford et al. (2001) reported that information retrieval effectiveness linked to the Internet perceptions of not finding one's way around, and lack of control and feelings that the Internet is too unstructured as per the authors say.

Spink (2002) points out that assessment of effectiveness are based on gauging the impact of users' interactions with search engines on information problems at the information-seeking stage. Hence, it can be well said that, in real life (work-in-practice), users base their overall assessment of search engines on how the search results support their overall goals, such as verifying a citation, rather than the specifics of the search results displayed among others.

Liaw, S. (2002) conducted a study to develop and test a conceptual model of individual perceptions of Web technology as a use and training tool. The model presents a perspective of users' attitudes toward Web environments. The model integrates the Technical Acceptance Model, Social Cognitive Theory, individual attitudes, motivation and self-efficacy perspectives to develop a new aspect of users' perceptions toward Web technology acceptance and use. The results of the study reveal that the conceptual model helps the understanding of user perceptions to Web environments. In conclusion, author recommends that training and educational programmes on computers may foster a positive feeling towards the use of search engines.

Legris and Collette (2003) reveals that users' prior knowledge and experience with search engines, their level of satisfaction of the retrieved search results makes users to reuse the search engine which they are acquainted with when they search for information and that, besides the aforesaid points, ease of use of search engine and users frequent interaction with technology enables one to become expert in the way of searching information.

Liao (2008) argues that we are facing information deluge on the Web and spend much time and effort examining the results provided by a search engine because search engines function with limited knowledge about users' preferences and search histories. A new research genre (structural re-ranking) now exists to examine how to re-rank search engine results, based on new contextual information, to better list search results in an order that is more desirable to a user (Joachims and Radlinski, 2007).

Haglund and Olsson (2008) argue that search methodology is often based on "trial and error" and is usually undertaken with no particular strategy. Study concludes that users often trade the quality of the results they obtain for effort and time spent searching and is confused about how to assess the quality of search outcomes. Based on their study of academic researchers, that trust and branding are significant factors in determining search engine use behavior.

Matheus (2009) investigated perceived ease of use of web sites, perceived usefulness, perceived information quality, and perceived system quality. The study reported that perceptions of system quality of a web site are correlated to perceptions of information quality of a web site. Perceived information quality of a web site was found to be determinant of perceived usefulness. Perceived usefulness of the web site was also found to influence the usefulness of the website. User's perceptions of web search engines are seen as having an influence on their searching strategies and interactions.

Weber and Jaimes (2011) analyzed a large query log of 2.3 million anonymous registered users from a web-scale U.S. search engine in order to jointly analyze their on-line behavior in terms of who they might be (demographics), what they search for (query topics), and how they search (session analysis) and found that there are important differences in search behavior across different demographic groups in terms of the topics they search for, and how they search.

Kim, J. (2008) examines the role of searchers' perceived level of difficulty in successful search performance. Author further examined the reasons underlying the perception of difficulty. Search performance data were collected through search logs whereby it was found that Perceived difficulty changed over time through increasing experience in searching as a searcher's perceived difficulty increases, his search performance decreases and this show some general agreement in the relationship between perceived difficulty and search performance.

Research Methodology

An online questionnaire was adopted given the fact that the selected universities are scattered throughout the country and the faculty members had a tight schedule in their academic activities, hence it was difficult to meet them. Time and resource constraints also contributed to opt for online questionnaires. The email addresses of the faculty members of the selected universities were collected from their university websites. To ensure easy distribution of the questionnaire, each university was selected one at a time and then

the questionnaire was sent to the faculty members of each respective universities. A Reminder email was sent to faculty members after a month to ensure that those who may have not filled up the questionnaire may fill it and to those who had filled it were acknowledged. The study was conducted on Faculty members of Science and Technology of five selected universities (Nairobi, Kenyatta, Maseno, Moi and Egerton).

Data analysis and interpretation

University-wise distribution of Questionnaires and their response rate

The table 1 deals with the distribution of questionnaires to the respondents. The highest response rate is from Jomo Kenyatta University of Agricultural and Technology with a response rate of 81.32% and lowest is from Egerton University whose response rate is 62.22%. The response rate of Kenyatta University, MOI University and Nairobi University is 80.99%, 72.88% and 71.99% respectively.

Table 1: University-wise distribution of the Questionnaires

Faculty Members	Universities					
	KU	JKUAT	Moi	Egerton	Nairobi	Total
Distributed	121	91	59	90	282	643
Received	98	74	43	56	203	474
Percentage (%)	80.99	81.32	72.88	62.22	71.99	73.71

Awareness of search engines by the respondents

Faculty members are presumed to be the consumers of latest information in the market. It is found in table 2 that the majority of the respondents i.e. 367 (77.43) have very good knowledge of search engines, 45 (9.49%) good knowledge about search engines, 38 (8.02%) respondents are uncertain with regard to their awareness while the least respondents i.e. 24 (5.06%) reveal that their awareness about search engines is poor. From the study it is found that the majority of the respondents opined that they are aware of search engines.

Table 2: Awareness of search engines by the respondents

Awareness	No of Respondents	Percentage (%)
Very Good	367	77.43
Good	45	9.49
Uncertain	38	8.02
Poor	24	5.06
Very Poor	00	00.00
Total	474	100.00

Awareness of search techniques by the respondents

The table 3 shows the awareness of search techniques by the respondents. The respondents have expressed their competence in terms of their awareness of the search engines and it is shown as per the response that majority of the respondents i.e.467 (95.57%) are aware of basic search techniques. Field search is the second search technique used by the respondents whose response is 199 (41.98%), phrase search i.e.187 (39.45%), case sensitivity 163 (34.39%), Boolean search 128 (27.00%), Advance search 85 (17.93%), Parentheses 54 (11.39%), and lastly Concept search 51 (10.76%) The study reveals that the respondents are aware of basic search which is easier to use and when it comes to advance search techniques, most of the faculty members are not aware of them.

Table 3: Awareness of search techniques by the respondents

Search Technique	No of respondents	Percentage (%)
Basic search	467	95.57
Field search	199	41.98

Phrase search	187	39.45
Case sensitivity	163	34.39
Boolean search	128	27.00
Advance search	85	17.93
Parentheses	54	11.39
Concept search	51	10.76

Use of Search engines by the respondents

Search Engines have now become a part of our daily life. Users are now becoming more dependent on search engines to get the answer for their queries. Faculty members were asked in table 4 about the search Engines they use to access EIRs. The data reveals that the majority of the respondents i.e. 474 (100%) use Google search engine to access EIRs, followed by, 390 (82.28%) use Yahoo, 375 (79.11%) use Ask, 346 (72.00%) use MNS, 320 (67.51 %) use Bing and 49 (10.34%) respondents use Hotbot. It is interesting to note that among the various search engines being used by the respondents, majority the of respondents used Google as it is easy to use and has user friendly features which enables wider access to information than the rest of other search engines.

Table 4: Use of Search engines by the respondents

Search engine	No of Respondents	Percentage (%)
Google	474	100.00
Yahoo	390	82.28
Ask	375	79.11
MNS	346	72.00
Bing	320	67.51
AltaVista	71	14.98
Hotbot	49	10.34

Basic field searches used by the respondents

Minimum knowledge about the basic field search will help the users to access and obtain the information required by them without wasting their precious time. Regarding various basic field searches used to refer to information, the respondents were asked to furnish the information regarding the basic field search they use to refer information and their response is as shown in table 5. The data clearly shows that the majority of the respondents i.e. 465 (98.16%) reveal that they use keyword as the basic field to refer to EIRS, 325 (68.62%) of respondents use title of article, 301 (63.54%) of respondents under study use journal title as a basic field search, 248 (52.33%) of respondents reveal that they use subject as a basic field search while the least respondents i.e. 199 (42.09%) use author as a basic field search to refer EIRs. Among the various available basic fields search, the study reveals that the majority of the respondents used keyword to search information as it is the easiest way to use.

Table 5: Basic field searches used by the respondents

Basic field search	No of respondents	Percentage (%)
Keyword	465	98.16
Title of article	325	68.62
Journal title	301	63.54
Subject	248	52.33
Author	199	42.09

Initiation in the use of search engines

The respondents were asked in table 6 about how they learnt to use search engines. The majority of the respondents i.e. 339 (71.52%) learnt to use search engines through trial and error followed by 84 (17.72%) respondents who learnt through Self Instruction, 26 (5.49%) learnt through guidance from Library staff, 19(4.01%) training programmes/workshops, 4(0.84%) through guidance from friends and 2 (0.42%) through courses offered by University respectively. The study reveals that majority of the respondents were initiated to use search engines through trial and error.

Table 6: Initiation in the use of search engines

Initiation	No of respondents	Percentage (%)
Trial and Error	339	71.52
Guidance from friends	4	0.84
Guidance From Library staff	26	5.49
Self Instruction	84	17.72
Courses offered by University	2	0.42
Training Programs/ Workshops	19	4.01
Total	474	100.00

Links used by the respondents to access information

There are various links which users can use to get linked to access information. The respondents were asked in table 7 about links they use to access information. Their response revealed that majority of the respondents i.e. 324 (68.35%) get links through search engines, 282 (59.49%) publisher website, 249 (52.53%) get links through Electronic Resource websites, 247 (52.13%) library websites and 186 (39.24%) get links through web-based library catalogue (OPAC).

Table 7: Links used by the respondents to access information

Links used to access EIRs	No of respondents	Percentage (%)
Links through search engine	324	68.35
Links through publisher website	282	59.49
Links through Electronic Resource website	249	52.53
Links through library website	247	52.13
Web-based library catalogue (OPAC)	186	39.24

Problems faced by the respondents while using search engines

Problems users face when using search engines are shown in table 8. The that majority of the respondents i.e.383 (80.88%) face difficulty in finding relevant information 366 (77.22%) too much information retrieval, 355 (74.89%) difficulty to read from the screen, 345 (72.78%) difficult to tell authenticity of sources, 337 (71.10%) frequent power fluctuation, 317 (66.88%) lack of computer terminal, 312 (65.82%) lack of knowledge to use search engines while the least problem faced by the users i.e. 259 (54.64%) is poor network connectivity. The study clearly reveals that respondents are facing several problems while and when using search engines.

Table 8: Problems faced by the respondents while using search engines

Problems	No of respondents	Percentage (%)
Difficulty in finding relevant information	383	80.88
Too much information is retrieved	366	77.22
Difficult to read from the screen	355	74.89
Difficulty to tell authenticity of sources	345	72.78
Frequent power fluctuation	337	71.10

Lack of computer terminals	317	66.88
Lack of knowledge to use search engines	312	65.82
Poor network connectivity	259	54.64

Training preferred by the respondents

There are various methods to train the users about search engines. The data presented in table 9 shows that majority of users i.e. 390 (82.28%) reveal that they require support when needed, 383 (80.80%) opine that they require library workshops with hands on experience, 361 (76.16%) of respondents reveal that they require computer assisting instructions, 341 (71.94%) of respondents point that they require self help guide, 310 (65.40%) of respondents state that they require one on one demonstrations, 290 (61.18%) of respondents under the study indicate that they prefer library orientation and 276 (58.23%) of respondents being the least respondents reveal that they could prefer provision of list of search engines and how to use them.

Table 9: Training preferred by the respondents

Training	No of Respondents	Percentage (%)
Support when needed	390	82.28
library workshops with hands-on experience	383	80.80
computer assisting instructions	361	76.16
Self-help guide/handout	341	71.94
One-on-one demonstrations	310	65.40
Library orientation	290	61.18
Provision of list of search engines and how to use them	276	58.23

Impact of use of search engines by the respondents

Respondents have given highly positive response about the impact of their usage of search engine. The results indicate that, out of 474 respondents, 455 (95.99%) satisfied with the retrieved information, followed by 454 (95.78%) who revealed that they are satisfied with the response time when using search engines to find needed information, 453 (95.57%) are satisfied with the performance when using search engines to find needed information, 444 (93.67%) need training to improve my level of experience with advanced search engines and 426 (89.87%) reveal that they will use the search engine to find needed information in the future as shown in table 10.

Table 10: Impact of use of search engines by the respondents

Impact of using search engines	No of respondents	Percentage (%)
I am satisfied with the retrieved information	455	95.99
I am satisfied with the response time when using search engines to find needed information	454	95.78
I am satisfied with the performance when using search engines to find needed information	453	95.57
I need training to improve my level of experience with advanced search engines	444	93.67
I will use the search engine to find needed information in the future	426	89.87

Implied Suggestions

Use of search engines is in progress as all university libraries of all the universities under the study are procuring required journals and offers wide range of electronic information resources which users use due to

their advanced features over print resources. To ensure that search engines are used well, there's a need for frequent Technological knowhow training programmes to faculty members on the latest changes in Technology-collection and their ease accessibility, user orientation programmes, MOOC (Massive Online Open Course) as nowadays, online lecture series are thought by experts in various subjects and by so doing, use of EIRs will improve up to great extent.

Faculty members serving in all five universities opined that, they are facing problems when and while using search engines like frequent power fluctuation, slow internet speed which results in delays and such hinders the faculty in the effective access to required information. In a changed environment and to improve the quality of higher education and research, the use of search engines is a must.

Hence, it is suggested to the University authorities to install on a priority basis more broadband connections with a good powerbase to enable a continuous access to required information by the faculty members.

References

1. Mostafa, J. (2005). Seeking better web searches. *Scientific American*, 292(2), 66-73.
2. J.R. Griffiths and P. Brophy, 2005. "Student searching behavior and the Web: Use of academic resources and Google," *Library Trends*, volume 53, number 4, pp. 539-554.
3. C. Cool and A. Spink, 2002. "Issues of context in information retrieval (IR): An introduction to the special issue," *Information Processing & Management*, volume 38, number 5, pp. 605-611.
4. L. Haglund and P. Olsson, 2008. "The impact on university libraries of changes in information behavior among academic researchers: A multiple case study," *Journal of Academic Librarianship*, volume 34, number 1, pp. 52-59.
5. Ford, N., Miller, D., & Moss, N. (2001). The role of individual differences in Internet searching: An empirical study. *Journal of the Association for Information Science and Technology*, 52(12), 1049-1066.
6. Lazonder, A. W., Biemans, H. J., & Wopereis, I. G. (2000). Differences between novice and experienced users in searching information on the World Wide Web. *Journal of the Association for Information Science and Technology*, 51(6), 576-581.
7. Legris, P., Ingham, J., & Collette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & management*, 40(3), 191-204.
8. Liaw, S. S. (2002). Understanding user perceptions of World-wide web environments. *Journal of computer assisted learning*, 18(2), 137-148.
9. Matheus, A. (2009). Factors affecting the successful use of Web sites. State University of New York at Albany.
10. Weber, I., & Jaimes, A. (2011, February). Who uses web search for what: and how. In *Proceedings of the fourth ACM international conference on Web search and data mining* (pp. 15-24). ACM.