USAGE PATTERN OF ACADEMIC SEARCH ENGINES: A SURVEY OF RESEARCH SCHOLARS OF KURUKSHETRA UNIVERSITY, KURUKSHETRA

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ABSTRACT

Search engines are about excitement, optimism, hope and enrichment. Search engines are also about despair and disappointment. A researcher while using search engines for resource discovery might have experienced one or the other sentiments. One may say that user satisfaction depends much upon the search strategies deployed by the user. But at the same time it also depends upon the quality of search engine used for information retrieval. Today, there are many search engines used for resource discovery. They display the results of the searches made in readily-comprehensible manner with lots of customization possibilities including refining and sorting. This paper is an attempt to analyze the usage pattern of academic search engines by the research scholars of Kurukshetra University.

Keywords: Search Engines, Google Scholar, Yahoo, Altavista, Excite, World Wide Web, Kurukshetra University

INTRODUCTION:

Today we are living in an era of information overload or information flood. With too much of information to handle, specially online information available over the world wide web (WWW), it has become very difficult for the user to search and find qualitative and authentic information in least possible time. The traditional search engines are of great help but when it comes to academics comprising of teachers & scholars there is need for better search systems. With web accommodating more document type in various file formats from diverse sources, an academic search engine can serve the scholars in a better manner in comparison of general search engines like Google or Yahoo.

SEARCH ENGINES:

A search engine is a program that searches documents for specified keywords and returns a list of the documents where the keywords were found. Although search engine is really a general class of programs, the term is often used to specifically describe systems like Google, Yahoo,

Alta Vista and Excite that enable users to search for documents on the World Wide Web. A web search engine is designed to search for information on the World Wide Web. The search results are generally presented in a list of results and are often called hits. The information may consist of web pages, images, information and other types of files. Some search engines also mine data available in databases or open directories.

Typically, a 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 each document. Each search engine uses a proprietary algorithm to create its indices such that, ideally, only meaningful results are returned for each query.

ACADEMIC SEARCH ENGINES:

Academic Search Engines (ASE) filter the whole world wide web and provide the user the scholarly content only related to the search conducted by the user. They save a great time of the user by presenting the content from journals, books, thesis & dissertations, conferences, institutional repositories, etc. They also help the research scholars in conducting literature review. The two ASEs considered for this study are Google Scholar and Scirus.

GOOGLE SCHOLAR

Google Scholar provides a simple way to broadly search for scholarly literature. From one place, you can search across many disciplines and sources: articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites. Google Scholar helps you find relevant work across the world of scholarly research.

FEATURES OF GOOGLE SCHOLAR

- RSearch diverse sources from one convenient place
- Find articles, theses, books, abstracts or court opinions
- Locate the complete document through your library or on the web
- Learn about key scholarly literature in any area of research

SCIRUS

Scirus claims to be the most comprehensive science-specific search engine on the Internet. Driven by the latest search engine technology, Scirus searches over 410 million science-specific Web pages, enabling users to quickly:

- Pinpoint scientific, scholarly, technical and medical data on the Web.
- Find the latest reports, peer-reviewed articles, patents, pre prints and journals that general search engines miss.
- Offer unique functionalities designed for scientists and researchers.

Scirus, the search engine for science, focuses only on Web pages containing scientific content. Searching more than 410 million science-related pages, Scirus helps you quickly locate scientific information on the Web:

- Google finds the rock ,if you search on REM ,For example .ific sitesscient-Filters out non among other things ,Scirus finds information on sleep -group
- Finds peer-reviewed articles such as PDF and PostScript files, which are often invisible to other search engines.
- Searches the most comprehensive combination of web information, preprint servers, digital archives, repositories and patent and journal databases. Scirus goes deeper than the first two levels of a Web site, thereby revealing much more relevant information.

PINPOINTING SCIENTIFIC INFORMATION

Scirus has a wide range of special features to help you pinpoint the scientific information you need. With Scirus, you can:

- Select to search in a range of subject areas including health, life, physical and social sciences.
- Narrow your search to a particular author, journal or article.
- Restrict your results to a specified date range.
- Find scientific conferences, abstracts and patents.
- Refine, customize and save your searches.

Scirus has proved so successful at locating science-specific results on the Web that the Search Engine Watch Awards voted Scirus 'Best Specialty Search Engine' in 2001 and 2002 and 'Best Directory or Search Engine Website' Web Award from Web Marketing Association in 2004, 2005, 2006 and 2007.

SCOPE OF THE STUDY

The study deals with the use pattern of the search engines by the research scholars of the Kurukshetra University.

OBJECTIVES OF THE STUDY

1. To understand the type of search engine being used by the researchers
2. To identify the specific search engine currently being used by the researchers
3. To identify the search behaviour while searching over the world wide web
4. To identify the problems faced by the researchers while online searching

5. To understand the satisfaction level of the researchers

6. To understand the preferred needs or requirements of the researchers pertaining to a search engine

RESEARCH METHODOLOGY

To analyze the usage behaviour of the search engines by the research scholars, a questionnaire was prepared and distributed amongst them. A total of 100 such questionnaires were prepared and divided into two halves of 50 each. A set of 50 questionnaires was distributed amongst male research scholars and an equal number were distributed amongst the female research scholars. The questionnaire consisted of 19 questions. The response collected from the scholars were then tabulated and analyzed according to parameters like filter, information type, file type, Boolean operators, email alerts, sorting, article title, journal title, etc. For the analysis purpose bar graphs and pie-chart were created for the visual presentation of the data.

ABOUT KURUKSHETRA UNIVERSITY (KU):

The Kurukshetra University was established in 1956 as a unitary residential University and its foundation stone was laid by late Dr. Rajendra Prasad, the first President of India. Located in the holy city of Kurukshetra, land of the historical battle of 'Mahabharata' and the great message of Bhagwad Gita. Starting with only the Department of Sanskrit, it has grown into a multi-faculty University as one of the premier centres for advanced study and research in the region. The University's programs combine the enduring value of a liberal arts education with the skills and experience offered by professional departments. The University has 445 teaching faculty members. The University also has 457 affiliated colleges and institutes

The population/ Universe comprised of all search scholars to analysis the usage behaviors and perception of AC. Search engines. A detailed questionnaire was prepared comprising 19 questions to obtain the data stratified quota sampling method was used. The whole population was divided into two groups on the basis of Gender i.e. male, female each consisting of 50 research scholars.

RESPONSE RATE:

In case of male respondents, all the filled questionnaires were received i.e. the response Rate was 100%. In case of female respondents 41 questionnaires were received i.e. 82%. The overall response rate was 91%.

DATA ANALYSIS AND INTERPRETATION

1. Search Engines Usage:

	Very frequently	Moderate	Very less usage	Never
Male	31 (62%)	15 (30%)	04 (8%)	-
Female	18 (43.90%)	15 (36.58%)	06 (14.63%)	02 (4.87%)
Total	49 (53.84%)	30 (32.96%)	10 (10.98%)	02 (2.19%)

Table 1

Table 1 provides detail about usage of search engine for finding information. It indicates that a majority of males (62%) as well as females (44%) use than very frequently. Overall 54% respondents use very frequently. Around 33% of the scholars use them moderately. However, only 2% said that have never used search engine. The table indicates that search engines have very less used by around 11% respondents.

2. Result Quantity:

	Always	Occasionally	Not noticed	Never
Male	23 (46%)	23 (46%)	04 ((8%)	-
Female	13 (31.70%)	18 (43.90%)	07 (17.07%)	03 (7.31%)
Total	36 (40.65%)	41(45.05%)	11(12.08 %)	03 (7.31%)

Table 2

Table 2 reveals that around 41% of the Respondents agree that search engines provide excessive results always while around 45% face the problem of excessive result occasion only, around 12% of the scholar have not noticed the pattern while around 3% of the scholar have never faced the problem of excessive result. The table also indicates that 46% of the male respondents and 32% of the female respondents obtain excessive result in every search done.

3. No. of Results consulted:

Search Results	5	6-10	11-15	16-20
Male	21 (42%)	15 (30%)	09 (18%)	05 (10%)
Female	07 (17.07%)	16 (39.02%)	13 (31.70%)	05 (12.19%)
Total	28 (30.76%)	31 (34.06%)	22 (24.17%)	10 (10.98%)

Table 3

Table 3 presents the scenario of the research scholars regarding the No. of search results consulted by them. it indicates that a majority of scholars i.e. 34% usually consult only five results while 24% are interested in the range of 11 to 15 results. The table also reveals that only around 11% of the users click on 16 to 20 and further results. In case of male respondents 42% go upto 5 results followed by 30% (6-10) results, 18% (11-15) results, 10% (16-20) results respectively. In case of female respondents around 39% check (6-10) results while 11-15 results are consulted around 32% followed by 5 results (17%) and 16-20(12%).

4. Satisfaction level:

	Always	Occasional	Can't say	Never
Male	17 (34%)	24 (48%)	09 (18%)	-
Female	11(26.82%)	23 (56.09%)	06 (14.63%)	01 (1.43%)
Total	28 (30.76%)	47 (51.64%)	15 (16.48 %)	0 1(1.09%)

Table 4

Around 50% of the male scholars are satisfied occasionally whereas 34% of them are always satisfied the results. This pattern is also available in case of women scholars with around 52% occasionally satisfied and around 31% always satisfied. Only 1.1% of the research scholars have mentioned that they are never satisfied with search result obtained. Detail also indicates that around 16.5% of the research scholars unable to judge their satisfaction level as they have not check all the results.

5. Relevance:

	All	Some	None	Unable to decide
Male	11 (22%)	38 (76%)	01(2%)	-
Female	09 (21.95%)	27 (65.85%)	05 (12.19%)	-
Total	20 (21.97%)	65 (71.42%)	06 (6.59%)	-

Table 5

The above table indicates that maximum of the male research scholars i.e. 76% consider that some of search results are relevant while 2% of them consider results totally irrelevant. In case of female research scholars the majority of them i.e. 66% consider some of the result as relevant. In total around 71% research scholars consider some of the result are relevant while around 22% research scholars find all the results are relevant.

6. Preferred Search Engines:

	Google	Yahoo	Bing	Others
Male	46 (80.70%)	07 (12.28 %)	01(1.75%)	03 (5.26%)
Female	38 (76%)	07 (14%)	02 (4%)	03 (6%)
Total	84 (78.50%)	14 (13.08%)	03 (2.80%)	06 (5.60%)

Table 6

Table 6 reveals the preference of research scholars regarding the use of particular search Engine. It indicates that while 81% male research scholars. use Google as their main search engines while it is preferred by 76% female research scholars . Yahoo is used by 13% RS where as Google us used by more than 78% RS. The usage of Bing SE is negligible i.e. 2.8% while 5.6% of the RS are using SE other than these three SEs.

7. Most Preferred Feature:

	Speed	No. of results	Clean interface	Relevant result
Male	22 (45.83%)	04 (8.33%)	05 (10.41%)	17 (35.41%)
Female	11 (24.44%)	16 (35.55%)	05 (11.11%)	13 (28.88%)
Total	33 (35.48)	20 (21.50%)	10 (10.75%)	30 (32.25%)

Table 7

Around 46% of male research scholars considers speed as the most preferred of the SE whereas around 35% of the consider relevance as the criteria amongst the female research scholars. Around 36% consider speed while 32% consider relevance as the most relevance feature. Clean interface ranks last i.e. around 11% (overall) while around 22% research scholars consider the most of results as the most important feature.

8. Helpfulness in Research:

	Significantly	little help	Average	Not of much use
Male	28 (56%)	03 (6%)	18 (36%)	01(2%)
Female	20 (48.78%)	05 (12.19%)	16 (39.02%)	-
Total	48 (52.74%)	08 (8.79%)	34 (37.36%)	01(1.09%)

Table 8

Table 8 deals with the perception and opinion of research scholars regarding the value SE in their research work. The data in Table 8 clearly indicate that majority of users i.e. 53% find the search engines significantly helpful in their research work. Around 37% research scholars believe that they get moderate help from the S.E. while around 9% research scholars find the SE of little help. However, only 1% of the research scholars have mentioned that SE are not of much use as per their research work in consult. Considering the perception of importance of S.E on the basis of gender, 56% of the male research scholars and 49% female research scholars consider the S.E. significant for their research work.

9. Search Options/ Facilities:

	Male	Female	Total
Basic search	45 (15.25%)	39 (15.35%)	84 (15.30%)
Advance search	44 (14.91%)	35 (13.77%)	79 (14.38%)
User defined no. of results per page	32 (10.84%)	24 (9.40%)	56 (10.20%)
Define search period (year range)	30 (10.16%)	26 (10.23%)	56 (10.20%)
Exact phrase search	31(10.50%)	30 (18.81%)	61 (11.11%)
Search Preferences	43 (14.57%)	32 (12.59%)	75 (13.66%)
Article title search	28 (9.49%)	41 (16.14%)	69 (12.56%)
Boolean Operator	42 (14.23%)	27 (10.62%)	69 (12.56%)
Total	295	254	549

Table 9

The above Table reveals that advance search is desired by around 14% of research scholars while customization of the results and year range are desired by around 10% of the research scholars. Around 11% of the research scholars want the feature of exact phase searching while search by article title and Boolean operator are preferred by 13% of the research scholars. The table also indicate that basic search is given the highest priority by the male and female community of research scholars In case of female research scholars. Boolean search operators are given least preference while customization of No. of Results per page given least importance by male research scholars community.

10. Features of Search Result:

	Male	Female	Total
Filter search	32 (13.27%)	35 (18.93%)	67 (15.43%)
Refine	34 (14.10%)	29 (15.02%)	63 (14.51%)
E-mail	37 (15.35%)	26(13.47)	63 (14.51%)
Save/export	37 (15.37%)	22 (11.39%)	59 (13.59%)
Sorting	30 (12.44%)	27 (13.98%)	57 (13.13%)
Alerts	35 (14.52%)	25(12.95%)	60 (13.82%)
Citation import	36 (14.93%)	29 (15.02%)	65 (14.97%)
Total	241	193	434

Table 10

Table 10 provides data regarding provisions pertaining of search results. It indicates that filtration of search result is required by the maximum no. of research scholars i.e. over 15% the citation import facility is given the next preference i.e. by around 15%. Refining and e-mailing of searching result is given the third and equal preference by around by 15% of the research scholars. 14% research scholars have given importance of saving of export search result and creating e-mail alerts of the selected results. Sorting of results is given the last priority by around 13% research scholars.

11. Additional Search Facility:

	Male	Female	Total
ISSN	28 (8.13%)	25 (8.62%)	53 (8.35%)
Journal Title	39 (11.33%)	34 (11.72%)	73 (11.51%)
Publisher	38 (11.04%)	33 (11.38%)	71 (11.19%)
Author	35 (10.17%)	35 (12.07%)	70 (11.04%)
Author Affiliation	22 (6.39%)	20 (6.90%)	42 (6.62%)
Digital Repository	36 (10.46%)	23 (7.93%)	59 (9.30%)
Web URL	34 (9.88%)	31 (10.69%)	65 (10.25%)
Link to KUK Library	35 (10.17%)	27 (9.31%)	62 (9.77%)
Full-text	35 (10.17%)	31 (10.69%)	66 (10.41%)
Sub Search	42 (12.20%)	31 (10.69%)	73 (11.51%)
Total	344	290	634

Table 11

According to Table 11 around 8% research scholars want ISSN search, 11.5% research scholars require journal title search, around 11% require publisher wise search as well as search by author name. The other facilities needed are author affiliation - around 7% searching of digital library - around 9% URL search - around 10%, full text result by 10% and subject search -11.5%.

Link to KUK library e-resources is desired by on 10% of the users which includes 9.31% female research scholars and 10.17% male research scholars. However, amongst the male research scholars the highest priority i.e. over 11% is given to journal title while least priority i.e. 6.4% is given to author affiliation. Among the female research scholars the highest priority 11.3% is given to author name followed by journal little (11.2%) however, they have given the least preference (7%) to author affiliation (same as the case in male research scholars).

12. Searching Within Information Types:

	Male	Female	Total
Abstracts	33 (8.89%)	33 (10.78%)	66 (9.74%)
Articles	44 (11.85%)	37 (12.09%)	81 (11.96%)
Article in press	32 (8.62%)	27 (8.82%)	59 (8.71%)
Books	40 (10.78%)	33 (10.78%)	73 (10.78%)
Company homepage	22 (5.92%)	21 (6.86%)	43 (6.35%)
Conferences	33 (8.89%)	32 (10.45%)	65 (9.60%)
Patents	34 (9.60%)	20 (6.53%)	54 (7.97%)
Pre Prints	28 (7.54%)	22 (7.18%)	50 (7.38%)
Reviews	37 (9.97%)	29 (9.47%)	66 (9.74%)
Scientist homepages	28 (7.54%)	23 (7.51%)	51 (7.53%)
Thesis & Dissertations	40 (10.78%)	29 (9.47%)	69 (10.19%)
Total	371	306	677

Table 12

Table 12 indicates that article are the most preferred (12%) information types followed by books (11%), thesis and dissertation (10.2%), reviews 10%, abstracts 10%, conferences 10% etc. "Articles in press" was an important information type 9% research scholars while patents work given preference around 8% research scholars also around 8% research scholars wants searching scientist homepages. In the male research scholars community around 12% highest want search with in articles while around 6% lowest want to search within company home pages among the female research scholars the pattern is almost same. In case of highest progresses i.e. articles 12.1%. However, the least priority (6.5%) is given to patents by them. The table also reveals that all of the information types have been selected by the research scholars without any exception.

13. File Formats:

	Male	Female	Total
PDF	30 (53.57%)	22 (33.33%)	52 (42.62%)
HTML	11 (19.64%)	12 (18.18%)	23 (34.84%)
PPT	03 (5.35%)	13 (19.69%)	16 (24.24%)
DOC	05 (9.92%)	13 (19.69%)	18 (14.75%)
Any	07 (12.5%)	06 (9.09%)	13 (10.65%)
Total	56	66	122

Table 13

According to table No. 13 PDF is the preferred file format for around 54% male research scholars followed by around 20% in case of HTML. PPT files format have been given least preference by 5.35% male research scholars. Amongst the female research scholars PDF and HTML file formats have been given first and 2nd priority i.e. 33% and 18% respectively. While PPT and DOC (MS Word) has been given equal preference i.e. 11.69% by the female research scholars. Upon considering the overall scenario the table reveals that PDF ranks the highest i.e. around 43% followed by HTML (35%), PPT (24%), DOC (Word) (15%). The table also indicates around 11% research scholars do not have and preferred file format.

14. Academic Search Engine:

	Yes	No
Male	27 (54%)	23 (46%)
Female	21 (51.21%)	20 (48.78%)
Total	48 (52.74%)	43 48 (47.25%)

Table 14

Gender	Google scholar	Scirus	Any other	G.S.E.	Total
Male	20 (68.96%)	01 (3.44%)	06 (20.68%)	02 (6.89%)	29
Female	17 (72.27%)	02 (9.09%)	02 (9.09%)	01 (4.54%)	22
Total	37 (72.54%)	03 (5.88%)	08 (15.68%)	03 (5.88%)	51

Table 15

According to table No. 14 &15, 54% male research scholars have the awareness of specialized Academic S.E. in which around 69% of them are using Google scholar for their research purposes, while 3.44% are using Scirus ASE. The study also reveals that around 21% of the research scholars are using a different academic S.E databases while around 7% male research scholars prefer general search engine. Around 46% male are not having awareness regarding any ASE.

In case of female research scholars around 51% are having the awareness of academic SE; in which around 72% are use Google scholar while around 9% are using Scirus. However, more

than 9% as female research scholars are using different ASC/Data base. The table indicates that 49% of the female research scholars are not having awareness any ASE.

The overall results of the table 14 depicts that around 53% of the scholars are using either Google scholar (73%) Scirus (6%) and different ASE around (16%) respectively.

RECOMMENDATIONS AND CONCLUSION:

The study reveals that the research scholars have shown their interest in a majority of features offered by academic search engines. It is suggested that they should try these specialized search engines and compare the results with the general search engines. These search engines may help the scholars to filter the scholarly web and do more focused search with added relevancy and accuracy. By adopting ASEs they can dilute the challenges of information overload and it may speed up the process of research. Scirus and Google Scholar are offering a win-win scenario for consumers and the content providers but we are waiting for the time when they come out to be a perfect "academic search engine" and a trusted friend of researchers.

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