Use of search engines by research scholars and faculty members of physics departments in the universities of Karnataka State

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Studies the use of various search engines, frequency of use of search engines, factors that influence use of the search engines, use of search strategy by Physics research scholars and faculty members in the universities of Karnataka State. Shows that majority of respondents (84.33%) used search engines to retrieve information on the Internet and most frequently used search engines are Google (72.85%) and Yahoo (53.57%).

Introduction

The growth of World Wide Web has been one of the most remarkable developments which have rapidly gained popularity and become most widely used application of the Internet. Today, the World Wide Web has emerged as the most powerful medium for information publishing and access. A plethora of information sources for education and research are available on the Web including scholarly journals, technical reports, theses, courseware, content pages, data set, patents, reference sources, discussion forums etc. As a result, the Web has become an ocean of all kinds of information or data, making any query into the huge information reservoir extremely difficult. In order to overcome this difficulty in retrieving information from WWW, several companies and institutions have developed various search aids called as search engines, which are widely used to find information on the Internet. The review of literature indicates that in the academic environment the teachers, research scholars and students also depend on search engines for retrieval of scholarly information on the web.

From the studies of Aula[1], Notess[2], Bazac[3], Jansen [4], Oppenheim[5], Jenkin[6] and Lazinger[7], the extent to which the search engines have been accepted and used for retrieval of scholarly information on the web is understood. In this context, this study tries to investigate the extent of use of search engines by the academic community in the universities of Karnataka State.

What is a search engine?

Search engine is a tool, which helps in retrieving information from the Internet. It is programmed in such a way that it indexes the Web and accordingly builds their databases. When the query has entered in the search engine, it checks its index with the query. Then relevant matches are retrieved and returned as 'hits' or 'search results'. In other words search engine acts as a searchable index of Web pages of the world.

Different search engines require different search strategies to retrieve information on the Internet. Searchers ability to find the information on the Internet is a function of how precise his queries are and how frequently he uses search strategies for different search engines. These issues play a very important role in retrieving relevant information on the Web. There are several effective ways to use special operators and search strategies to target the result.

In this paper, an attempt has been made to know the use of different search engines, frequency of use of search engines, factors influencing the use of search engine,

use of search strategy for information retrieval and techniques used to learn the search strategy by the research scholars and faculty members of Physics in the universities of Karnataka State.

Survey respondents and survey instrument

The respondents of the present survey constitute all the 189 research scholars and faculty members in the department of physics in six universities in Karnataka State and the Indian Institute of Science, Bangalore.

A questionnaire was designed to collect researchers' demographic information, frequency of use of Internet tools and its applications, by research scholars and faculty members. All the questionnaires were distributed personally to the research scholars and faculty members and dully-filled questionnaires were collected for further analysis.

Characteristics of respondents

The number of respondents from the six universities of Karnataka State and Indian Institute of Science are presented in Table 1.

Table 1 illustrates that the number of respondents are more from Bangalore University and Karnataka University (15.35% each) followed by Gulbarga University (14.82%). The number of respondents in University of Mysore, Mangalore University and Indian Institute of Science are same (14.28% each) and the Kuvempu University comes last in that order (11.64%).

Tables 2 and 3 describe the designation (Research scholar and Faculty member), and gender of respondents respectively. The response shows that 54.49% are faculty

Table 1— University-wise distribution of respondents

University	No. of respondents	Percentage
Kuvempu University	22	11.64
University of Mysore	27	14.28
Bangalore University	29	15.35
Karnatak University	29	15.35
Mangalore University	27	14.28
Gulbarga University	28	14.82
Indian Institute of Science	27	14.28
Total	189	100.00

Table 2 — Distribution of respondents by designation

University	Research scholars	Faculty members	Total
Kuvempu University	7 (31.81)	15 (68.18)	22
University of Mysore	12 (44.44)	15 (55.55)	27
Bangalore University	12 (41.37)	17 (58.62)	29
Karnatak University	11 (37.93)	18 (62.06)	29
Mangalore University	10 (37.03)	17 (62.96)	27
Gulbarga University	12 (42.85)	16 (57.14)	28
Indian Institute of Science	22 (81.48)	5 (18.51)	27
Total	86 (45.5)	103 (54.49)	189

Note: Number given in parenthesis represents the percentage

members and 45.5% are research scholars. Table 3 shows that 82.53% are male and 17.46% are female.

Use of Internet

The questionnaire consists of several questions regarding the use of Internet as well as search engines. Based on the responses, the percentage of use of Internet and search engine among the academic community could be determined.

It is found that majority of the respondents (87.83%) could be considered as Internet users. Here an Internet user is defined as a person who has used its one or more facilities for research, teaching or general and e-mail purposes.

As shown in Table 4, significant difference could be found regarding use of Internet among the respondents of different universities and the research institution. The percentage of Internet use accounts 100% for both Indian Institute of Science and Mangalore University. However considering the overall response, the use of Internet could be remarkably well represented as the least user university comes out with nearly 73%. It is observed that the findings of the present study are in line with the findings of Lazinger and others (1997) [8].
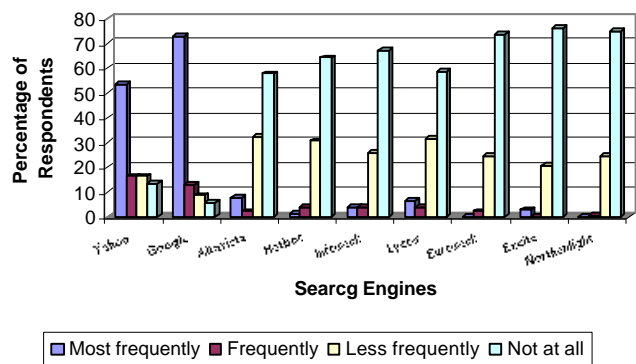

Fig.1 — Frequency of use of search engines

Table 3 — Distribution of respondents by sex

University	Male	Female	Total
Kuvempu University	18 (81.81)	4 (18.18)	22
University of Mysore	24 (88.88)	3 (11.11)	27
Bangalore University	18 (62.06)	11 (37.93)	29
Karnatak University	24 (82.75)	5 (17.24)	29
Mangalore University	25 (92.59)	2 (7.4)	27
Gulbarga University	24 (85.71)	4 (14.28)	28
Indian Institute of Science	23 (85.18)	4 (14.81)	27
Total	156 (82.53)	33 (17.46)	189

Note: Number given in parenthesis represents the percentage

Table 4 — Use of Internet

University	Yes	No
Kuvempu University(n=22)	16 (72.72)	6 (27.27)
University of Mysore (n=27)	24 (88.88)	3 (11.11)
Bangalore University (n=29)	26 (89.65)	3 (10.34)
Karnatak University (n=29)	25 (86.2)	4 (13.79)
Mangalore University (n=27)	27 (100)	-
Gulbarga University (n=28)	21 (75)	7 (25)
Indian Institute of Science(n=27)	27 (100)	-
Total (n=189)	166 (87.83)	23 (12.16)

Note: Number given in parenthesis represents the percentage

They conducted a study on Internet use by faculty members in various disciplines. The primary focus of the research was to examine and compare the use of Internet among the various sectors of the faculty at the Hebrew University of Jerusalem. The study found that among the respondents 80.3% used Internet.

Use of search engines

Regarding the use of search engines majority of respondents (84.33%) reported that they used search engines to retrieve information on the Internet and only a few of them mentioned that they have not used search engines (15.66%). Organisation-wise use of search engine analysis indicates that 100% of respondents from Karnatak University, Mangalore University and Indian Institute of Science followed by University of Mysore (91.66%) used search engines for retrieving information on the Internet (See Table 5).

From the present study, it is found that overall, 84% of respondents used search engines to search and retrieve information on the Internet.

Frequency of use of search engine

How do users search information resources on the Internet? The respondents were shown a list of nine

Table 5 — Use of search engines

University	Response	
	Yes	No
Kuvempu University (n=16)	10 (62.5)	6 (37.5)
University of Mysore (n=24)	22 (91.66)	2 (8.33)
Bangalore University (n=26)	15 (57.69)	11 (42.3)
Karnatak University (n=25)	25 (100)	-
Mangalore University (n=27)	27 (100)	-
Gulbarga University (n=21)	14 (66.66)	7 (33.33)
Indian Institute of Science (n=27)	27 (100)	-
Total (n=166)	140 (84.33)	26 (15.66)

Note: Number given in parenthesis represents the percentage

search engines and were requested to indicate whether they use them most frequently, frequently or less frequently for information search. Table 6 indicates that perhaps not unexpectedly, Google (72.85%) and Yahoo (53.57%) are most frequently used search engines while Altavista (32.14%), Lycos (31.42%) and Hotbot (30.71%) are used less frequently. The search engines viz., Excite (76.42%), Northen light (75%), Euroseek (73.57%) and Infoseek (67.14%) have not been used (Figure 1).

Factors that influenced the use of search engine

Respondents were also asked to mention the major factors, which influenced the use of search engines. Table 7 demonstrates that to full extent, majority of respondents mentioned that search engine is most popular (42.85%) followed by using the search engine more information can be accessed (42.14%) and easy to connect on the Internet (35.71%). To some extent 42.14% and 40.71% of respondents mentioned that search engine is most popular and it is user friendly respectively.

Awareness of search strategy

Table 8 clearly shows that 84.33% of respondents are aware of search strategy of different search engines and 15.66% of them are not aware of search strategy. In case of Karnataka University, Mangalore University and Indian Institute of Science the awareness of search strategy of different search engines is 100%.

Techniques used to learn the search strategy

Table 9 shows how the respondents learnt search strategy of respective search engines to retrieve information on the Internet.

Majority of respondents reported that help feature in the was used to learn the search strategy of the particular

Table 6 — Frequency of use of search engines

University		a	b	c	d	e	f	g	h	i
Kuvempu University (n=10)	1	4 (40)	6 (60)	-	-	-	-	-	-	—
	2	6 (60)	4 (40)	-	-	-	-	-	-	-
	3	-	-	3 (30)	2 (20)	-	-	-	-	-
	4	-	-	7 (70)	8 (80)	10 (100)	10 (100)	10 (100)	10 (100)	1 (10)
University of Mysore (n=22)	1	12 (54.54)	13 (59.09)	5 (22.72)	2 (9.09)	2 (9.09)	3 (13.63)	-	2 (9.09)	-
	2	6 (27.27)	5 (22.72)	-	2 (9.09)	-	-	2 (9.09)	-	-
	3	2 (9.09)	2 (9.09)	2 (9.09)	8 (36.36)	6 (27.27)	4 (18.18)	5 (22.72)	2 (9.09)	2 (9.09)
	4	2 (9.09)	2 (9.09)	15 (68.18)	10 (45.45)	14 (63.63)	15 (68.18)	15 (68.18)	18 (81.81)	20 (90.9)
Bangalore University (n=15)	1	10 (66.66)	7 (46.66)	-	-	-	-	-	-	-
	2	-	3 (20)	1 (6.66)	-	-	1 (6.66)	-	-	1 (6.66)
	3	-	2 (8)	1 (6.66)	1 (6.66)	2 (13.33)	1 (6.66)	1 (6.66)	1 (6.66)	2 (13.33)
	4	5 (33.33)	3 (20)	13 (86.66)	14 (93.33)	13 (86.66)	13 (86.66)	14 (93.33)	14 (93.33)	12 (80)
Karnatak University (n=25)	1	14 (56)	22 (88)	2 (13)	-	-	2 (8)	-	2 (8)	-
	2	5 (20)	-	-	-	3 (12)	3 (12)	-	-	-
	3	6 (24)	2 (8)	10 (40)	3 (12)	5 (20)	9 (36)	5 (20)	3 (12)	6 (24)
	4	-	1 (4)	12 (48)	22 (88)	17 (68)	11 (44)	20 (80)	20 (80)	19 (76)
Mangalore University (n=27)	1	18 (66.7)	18 (66.7)	-	-	1 (3.7)	2 (7.4)	-	-	-
	2	6 (22.2)	6 (22.2)	1 (3.7)	1 (3.7)	2 (7.4)	1 (3.7)	1 (3.7)	-	-
	3	2 (7.4)	2 (7.4)	15 (55.6)	13 (48.1)	11 (40.7)	14 (51.9)	12 (44.4)	12 (44.4)	12 (44.4)
	4	1 (3.7)	1 (3.7)	11 (40.7)	13 (48.1)	13 (48.1)	10 (37)	14 (51.9)	15 (55.6)	15 (55.6)
Gulbarga University (n=14)	1	7 (50)	10 (71.42)	2 (14.28)	-	2 (14.28)	2 (14.28)	-	-	-
	2	-	-	-	2 (14.28)	-	-	-	-	-
	3	2 (14.28)	4 (28.57)	2 (14.28)	6 (42.85)	2 (14.28)	4 (28.57)	1 (7.14)	1 (7.14)	2 (14.28)
	4	5 (35.71)	-	10 (71.42)	6 (42.85)	10 (71.42)	6 (42.85)	13 (92.85)	13 (92.85)	12 (85.71)
Indian Institute of Science	1	10 (37)	26 (96.3)	1 (3.7)	-	-	-	-	-	-
	2	-	-	1 (3.7)	-	-	-	-	-	-

(n=27)		a	b	c	d	e	f	g	h	i
	3	11 (40.7)	-	12 (44.4)	10 (37)	10 (37)	10 (37)	10 (37)	10 (37)	10 (37)
	4	6 (22.2)	1 (3.7)	13 (48.1)	17 (63)	17 (63)	17 (63)	17 (63)	17 (63)	17 (63)
Total (n=140)	1	75 (53.57)	102 (72.85)	11 (7.85)	2 (1.42)	5 (3.57)	9 (6.42)	-	4 (2.85)	-
	2	23 (16.42)	18 (12.85)	3 (2.14)	5 (3.57)	5 (3.57)	5 (3.57)	3 (2.14)	-	1 (0.71)
	3	23 (16.42)	12 (8.57)	45 (32.14)	43 (30.71)	36 (25.71)	44 (31.42)	34 (24.28)	29 (20.71)	34 (24.28)
	4	19 (13.57)	8 (5.71)	81 (57.85)	90 (64.28)	94 (67.14)	82 (58.57)	103 (73.57)	107 (76.42)	105 (75)

Note: 1-Most frequently, 2- Frequently, 3- Less frequently, 4 – Not at all
a- Yahoo, b- Google, c- Altavista, d- Hotbot, e- Infoseek, f- Lycos, g-Euroseek, h-Excite, I-Northernlight
(Number given in parenthesis represents the percentage)

Table 7 — Factors influencing use of the search engine

University		Factors				
		a	b	c	d	e
Kuvempu University (n=10)	1	6 (60)	-	-	-	-
	2	4 (40)	6 (60)	3 (30)	5 (50)	-
	3	-	4 (40)	7 (70)	5 (50)	10 (100)
	4	-	-	-	-	-
University of Mysore(n=22)	1	11 (50)	14 (63.63)	13 (59.09)	10 (45.45)	12 (54.54)
	2	11 (50)	8 (36.36)	7 (31.81)	-	-
	3	-	-	-	6 (27.27)	5 (22.72)
	4	-	-	2 (9.09)	6 (27.27)	5 (22.72)
Bangalore University (n=15)	1	7 (46.66)	6 (40)	5 (33.33)	5 (33.33)	5 (33.3)
	2	-	6 (40)	4 (26.66)	4 (26.66)	2 (13.33)
	3	3 (20)	-	-	1 (6.66)	4 (26.66)
	4	5 (33.33)	3 (20)	6 (40)	5 (33.33)	4 (26.66)
Karnatak University (n=25)	1	12 (48)	12 (48)	7 (28)	5 (20)	12 (48)
	2	12 (48)	13 (52)	15 (60)	15 (60)	7 (28)
	3	1 (4)	-	-	3 (12)	1 (4)
	4	-	-	3 (12)	2 (8)	5 (20)
Mangalore University (n=27)	1	16 (59.3)	17 (63)	18 (66.7)	12 (44.4)	10 (37)
	2	9 (33.33)	10 (37)	9 (33.33)	12 (44.4)	14 (51.9)
	3	-	-	-	3 (11.1)	3 (11.1)
	4	2 (7.4)	-	-	-	-
Gulbarga University (n=14)	1	4 (28.57)	4 (28.57)	1 (7.14)	4 (28.57)	5 (35.71)
	2	3 (21.42)	5 (35.71)	7 (50)	3 (21.42)	3 (21.42)
	3	-	-	6 (42.85)	6 (42.85)	1 (7.14)
	4	7 (50)	5 (35.71)	-	1 (7.14)	5 (35.71)
Indian Institute of Science (n=27)	1	4 (14.8)	6 (22.2)	2 (7.4)	6 (22.2)	6 (22.2)
	2	20 (74.1)	7 (25.9)	12 (44.4)	6 (22.2)	6 (22.2)
	3	2 (7.4)	13 (48.1)	11 (40.7)	13 (48.1)	13 (48.1)
	4	1 (3.7)	1 (3.7)	2 (7.4)	2 (7.4)	2 (7.4)
Total (n=140)	1	60 (42.85)	59 (42.14)	46 (32.85)	42 (30)	50 (35.71)
	2	59 (42.14)	55 (39.28)	57 (40.71)	45 (32.14)	32 (22.85)
	3	6 (4.28)	17 (12.14)	24 (17.14)	37 (26.42)	37 (26.42)
	4	15 (10.71)	9 (6.42)	13 (9.28)	16 (11.42)	21 (15)

Note: 1- To full extent, 2- To some extent, 3- To little extent, 4 - Not at alla- The search engine is most popular, b-More information can be retrieved, c – Search engine is user friendly, d – I know search strategy of search engine, e - Easily opens on the Internet(Number given in parenthesis represents the percentage)

search engine (32.85%). 31.42% of the respondents reported that by reading articles/books on a specific search engine to some extent. It is also observed that respondents learnt search techniques of different search engines with the help of colleagues/ friends (27.85%) followed by library staff/commercial centers (27.14%).

Since the search engines are user-friendly and they provide help message in their home page, the respondents reported that they used help message to learn the search

Table 8 — Awareness of search strategy

University	a) Yes	Response No
Kuvempu University (n=16)	10 (62.5)	6 (37.5)
University of Mysore (n=24)	22 (91.66)	2 (8.33)
Bangalore University (n=26)	15 (57.69)	11 (42.3)
Karnatak University (n=25)	25 (100)	-
Mangalore University (n=27)	27 (100)	-
Gulbarga University (n=21)	14 (66.66)	7 (33.33)
Indian Institute of Science (n=27)	27 (100)	-
Total (n=166)	140 (84.33)	26 (15.66)

Note: Number given in parenthesis represents the percentage

Table 9 — Techniques used to learn the search strategy

University		Techniques a	b	c	d
Kuvempu University (n=10)	1	4 (40)	8 (80)	-	-
	2	6 (60)	2 (20)	-	-
	3	-	-	8 (80)	10 (100)
	4	-	-	2 (20)	-
University of Mysore (n=22)	1	11 (50)	9 (40.9)	3 (13.63)	8 (36.36)
	2	11 (50)	12 (54.54)	8 (36.36)	10 (45.45)
	3	-	1 (4.54)	1 (4.54)	-
	4	-	-	10 (45.45)	4 (18.18)
Bangalore University (n=15)	1	3 (20)	3 (20)	3 (20)	3 (20)
	2	2 (13.13)	2 (13.13)	2 (13.13)	3 (20)
	3	-	2 (13.13)	-	-
	4	10 (66.66)	8 (53.33)	10 (66.66)	9 (60)
Karnatak University (n=25)	1	8 (32)	2 (8)	-	3 (12)
	2	6 (24)	7 (28)	12 (48)	15 (60)
	3	4 (16)	6 (24)	6 (24)	-
	4	7 (28)	10 (40)	7 (28)	7 (28)
Mangalore University (n=27)	1	5 (18.5)	2 (7.4)	1 (3.7)	6 (22.2)
	2	12 (44.4)	10 (37)	8 (29.6)	10 (37)
	3	5 (18.5)	8 (29.6)	11 (40.7)	4 (14.8)
	4	5 (18.5)	7 (25.9)	7 (25.9)	7 (25.9)
Gulbarga University (n=14)	1	5 (35.71)	-	2 (14.28)	3 (21.42)
	2	-	7 (50)	3 (21.42)	-
	3	2 (14.28)	1 (7.14)	5 (35.71)	5 (35.71)
	4	7 (50)	6 (42.85)	4 (28.57)	6 (42.85)
Indian Institute of Science (n=27)	1	1 (3.7)	2 (7.4)	2 (7.4)	7 (25.9)
	2	4 (14.8)	4 (14.8)	5 (18.5)	1 (3.7)
	3	6 (22.2)	8 (29.6)	7 (25.9)	7 (25.9)
	4	7 (25.9)	13 (48.1)	13 (48.1)	12 (44.4)
Total (n=140)	1	46 (32.85)	26 (18.57)	11 (7.85)	30 (21.42)
	2	41 (29.28)	44 (31.42)	38 (27.14)	39 (27.85)
	3	17 (12.14)	26 (18.57)	38 (27.14)	26 (18.57)
	4	36 (25.71)	44 (31.42)	53 (37.85)	45 (32.14)

Note: 1- To full extent, 2- To some extent, 3- To little extent, 4- Not at all
a- Using help features in the search engine, b-By reading articles/books on a specific search engine, c- Help from library staff/commercial, d - Discussion with colleagues/friends(Number given in parenthesis represents the percentage)

strategies to retrieve information on the Web followed by the using books and articles rather than using above mentioned techniques.

Conclusion

From the present study, it is found that majority of respondents are aware of Yahoo and Google meanwhile they are not aware of many other search engines viz., Lycos, Hotbot, Excite, Northernlight etc. These are also useful search engines like Yahoo and Google to retrieve information on the Internet. Therefore the librarians should spread awareness about the different search engines and also introduce a training program on effective search techniques and strategies for different search engines.

Study also shows that few respondents learnt Internet use through library staff and quite a good number of users learnt through using help features and by reading articles on search engine. In this regard, librarians should organise workshop on use of search engines and also assist them at the time of searching literature using search engine.

Librarians should work in conjunction with subject faculty to select appropriate search engines for research scholars and faculty member's use. This activity may involve different levels of efforts and types of end products, ranging from selection of a few recommended search engines for demonstration to specialised search engines which are used to retrieve specialised Web pages providing access points or gateways to authoritative Web information.

To help research scholars and faculty members to distinguish between the useful and the not so useful search engines, librarians need to continue to emphasise evaluation criteria for evaluating search engine. They need to be able to guide research scholars and faculty members toward the useful search engines that can be found on the Web.

Although respondents in this survey have become increasingly aware of using search engines, they are not very familiar in searching information using the search engines. Library instructional programs should emphasise on the use of different search engines and their search strategies in retrieving need based information.

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