

User Behaviour on the Web in a University Environment: A Case Study

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ABSTRACT

World wide web-based sources have become important for education and research. Understanding the behaviour of users in using these systems, hence is essential. Though many studies have been reported worldwide there is a dearth of such studies from the Indian point of view. The study based on the method of observation and interview was undertaken to ascertain how the postgraduate students of Gulbarga University, Gulbarga (N=49) behave on the web. The study indicates that the students are familiar computer and have an acquaintance with various activities on computer. It also indicates students' familiarity with Internet but their level of understanding of Internet, conceptually and practicality varied. As majority of students under study using Internet and the Web had no formal training, their search efficiency also varied. This certainly advocates for a regular and rigorous training programme by the departments of library and information sciences of various universities, particularly on how to find information on Web.

Keywords: World wide web, user behaviour, postgraduate students, Gulbarga University

1. INTRODUCTION

Emerging technologies continue to offer librarians new opportunities to improve user services. The use of the world wide web (WWW), developed in 1989 by CERN Laboratory, Switzerland, has now reached global proportions. Almost every protocol type available on the Internet is accessible on the Web. The WWW-based electronic sources have become important resources for education and research. Understanding the behaviour of users in using

these systems, hence is essential. Many studies have been conducted in this regard.

The study conducted using video camera in the Rijksinstituut voor Volksgezondheid en Milieu (State Institute for Public Health and the Environment), the Netherlands¹, showed that the subject knowledge made little difference in the ability to retrieve information. Chowdhary's studies^{2,3}, Keily's⁴ analysis of search techniques and navigational patterns, D'Esposito and

Gardner's⁵ investigation on students perception of the Internet, Lin and Lu's⁶ study on understanding behavioural intention of using a website, Hoelscher and Strube's⁷ work on search behaviour of Internet experts, are few of the prominent studies. Other studies⁸⁻¹⁸ provided information on users' cognitive, affective and physical behaviour.

The literature reported from the Indian point of view is exploratory in nature and there is still lack of such studies in different environment¹⁹. Although Internet is being used by millions of user all over the world, very few studies have been published about what it is used for and by whom. Despite the growth in the number of Internet users, the studies from the perspective of library and information services regarding academic use of Internet resources and services in different settings, including users behaviour on the web, is at its infancy. Hence, the present study was conducted to identify the users' behaviour on the web in an academic environment.

2. METHODOLOGY

The method of observation and interview was adopted for the study and a structured interview schedule was tailored taking into consideration the objectives of the study. The study was undertaken to ascertain how the postgraduate students of Gulbarga University, Gulbarga behave on the Web. Gulbarga University, established in 1980, offers postgraduate and research programmes through 36 Postgraduate (PG) departments spread over four PG Centres. On the main campus (*Jnana Ganga*) there are 29 PG departments having more than 2000 students. The University offers Internet facility at two places: In the library and in the Central Computer Facility (CCF).

The CCF has better infrastructure facility compared to the Library. It has 35 terminals for accessing the Internet. It is working from 8 a.m. to 5 p.m. The fee structure is Rs 200/- for an academic year and has a better enrollment of Internet users than the library. As 280 students from various PG

departments had enrolled during the academic year 2004-05, CCF was chosen to observe the study population for their behaviour. Observations were made and interviews were conducted using structured interview schedule from December 2004 to January 2005. A total of 150 PG students belonging to different PG departments were contacted. Of them, 54 were using the Internet. Among those, 49 gave their consent to get themselves observed while using the Internet.

3. CHARACTERISTICS OF THE POPULATION UNDER STUDY

Sixty-nine per cent of the population under study comprised male; more than half being science graduates with English as the medium of instruction. Sixty-one per cent among them being urbanites and 75 per cent hostilities. A larger majority of the study population had TV, radio, stereo, and mobile. None of them had Internet connection while a mere 14 per cent had computers (Table 1).

4. RESULTS

4.1 Use of Computers

Nearly one-third of the students (32.7%) under study had been using computers for more than two years, while 30 per cent of them were using it for the past six months only. The remaining (41.3%) had exposure to computers for more than six months but less than two years. More than 85 per cent graded themselves as average in the use of computers. Very few rated themselves as experts (N=2), while 10 per cent accepted that they were novice. It is surprising to note that more than 60 per cent of the students, who were using computers, had not received any formal training in the use of computers. At the same time, more than 18 per cent had learnt computers as part of their curriculum (Table 2).

The students under study were good at creating folders and files (mean: 2.49) and well acquainted with MS Word (mean: 2.53). They were poor in programming languages (mean: 0.84) and utility softwares (mean: 0.57; Table 3).

Table 1. Characteristics of study population

Characteristic	Number	Percentage
Gender		
Male	34	69.4
Female	15	30.6
Faculty		
Social Science	18	36.7
Science	25	51.1
Arts and Humanities	06	12.2
Basic Degree		
BSc	25	51.1
BA	13	26.5
BCom	11	22.4
Medium of Instruction		
English	32	65.3
Kannada	17	34.7
Domicile		
Rural	19	38.8
Urban	30	61.2
Stay		
Hostel	37	75.5
Home	12	24.5
Availability of gadgets		
Computer	07	14.3
Television	43	87.8
Stereo system	24	49.0
Radio	44	89.9
Mobile	26	53.1
Internet	00	00

Table 2. Use of computer

Characteristic	Number	Percentage
Duration		
> 6 months	15	30.6
6 months–2 years	18	36.7
< 2 years	16	32.7
Grading		
Novice	05	10.2
Average	42	85.7
Expert	02	04.1
Training in the use of computer		
Yes	19	38.8
No	30	61.2
Learnt as part of curriculum		
Yes	09	18.4
No	40	81.6

4.2 Use of Internet

More than 34 per cent of the students started using Internet recently and more than 18 per cent were using it for more than

two years. The remaining 48 per cent experience of more than six months but less than two years. Nearly 90 per cent of those using Internet grade themselves as average, few as experts (N=3), and still fewer as novices (N=2). More than three-fourth of the population under study had not undergone any formal training in the use of Internet while about eight per cent had learnt Internet as part of their curriculum. The Internet at present is being used for various purposes. Finding course-related material (N=48), visiting websites (N=44), news and events (N=42), e-mail (N=40), and career information and advertisements (N=37) were the major purposes for which the students were using Internet (Table 4).

4.3 Knowledge of Internet: Conceptual and Practical

One of the objectives of the study was to know the students' awareness regarding various Internet-related concepts, both conceptual and practical. First, they were asked to show how well they had understood the concept theoretically and later to demonstrate it practically. It was found that the theoretical and practical awareness regarding concepts like website, www, and webpage was really good. The students showed a poor response for 'subject gateways'. As far as their exposure to 'search engines' was concerned, theoretically they were average but practically they performed better.

The knowledge of the students was average with regard to home page and e-journals. Their practical concepts regarding URL and http were not clear though theoretically they could answer these with ease (Table 5).

4.4 Search Behaviour on the Web

To effectively scale out the students' searching skills, all of them were given the same queries, ranging from simple to complex. To make search interesting for the students and to get proper results of their searching

Table 3. Acquaintance with various activities on computer

Acquaintance	Poor	Average	Good	Excellent	Mean (Rank)
Creating Folders and files	05 (10.2%)	01 (2%)	08 (16.4%)	35 (71.4%)	2.49 (2)
MS Word	3 (6.1%)	1 (2%)	12 (24.5%)	33 (67.3%)	2.53 (1)
MS Excel	14 (28.6%)	2 (4.1%)	5 (10.2%)	28 (57.1%)	1.96 (4)
MS PowerPoint	13 (26.5%)	1 (2%)	9 (18.4%)	26 (53.1%)	1.98 (3)
Utility software	39 (79.6%)		2 (4.1%)	8 (16.3%)	0.57 (6)
Programming languages	33 (67.3%)		7 (14.3%)	9 (18.4%)	0.84 (5)

Table 4. Use of Internet

Characteristic	Number	Percentage
Duration		
> 6 months	17	34.7
6 months –2 years	23	46.9
< 2 years	09	18.4
Grading		
Novice	02	4.1
Average	44	89.8
Expert	03	6.1
Training in the use of Internet		
Yes	12	24.5
No	37	75.5
Learnt as part of curriculum		
Yes	4	8.2
No	45	91.8
Purpose		
Course related material	48	98.0
E-mail, Chatting etc	40	81.6
Visit websites	44	89.8
Entertainment, games etc	21	42.9
Career information	37	75.5
News and events	42	85.7
Downloading Programs	11	22.4

skills, queries from different fields were selected. Following queries were posed:

- ✘ Use of Internet
- ✘ Usage of Internet in universities

- ✘ Functions of UNO
- ✘ Free e-journals on web
- ✘ Achievements of India in space technology
- ✘ Role of India in world space
- ✘ Survey on child labour in Karnataka with special reference to hotel industries
- ✘ Effects of drought on the economy of developing countries with special reference to India, and
- ✘ Impact of tsunami on religious tourism in India: A case study of southern coastal temples.

It was found that a large majority of the students were poor in query formulation. They had no problem if the query contained less than two terms (mean: 1.96). If the query had more than five terms, their ability to formulate the search strategy was very poor (mean: 0.84). They simply typed the question itself, however long it be. If the query contained between two to five terms, their ability was found to be average (mean: 1.43). It was also noticed that few students were really good in formulating the search strategy but the number was very less (N=3), therefore they got poor hit results; sometime, too large and sometime nil (mean: 0.53).

Table 5. Concept and practical knowledge of Internet

Knowledge	Poor	Average	Good	Excellent	Mean (Rank)
Website					
Conceptual	10 (20.4 %)	-	03 (6.1%)	36 (73.5 %)	2.53 (1)
Practical	09 (18.4 %)	01 (2 %)	07 (14.3 %)	32 (65.3 %)	2.27 (3)
URL					
Conceptual	27 (55.1%)	1(2 %)	11 (22.4 %)	10 (20.4 %)	1.08 (8)
Practical	36 (73.5 %)	-	5 (10.2 %)	8 (16.3 %)	0.69 (8)
Http					
Conceptual	21 (42.9 %)	3 (6.1 %)	14 (28.6 %)	11 (22.4 %)	1.31 (5)
Practical	27 (55.1%)	5 (10.2 %)	8 (16.3 %)	9 (18.4 %)	0.98 (7)
WWW					
Conceptual	2 (4.1%)	2 (4.1%)	25 (51 %)	20 (40.8 %)	2.29 (3)
Practical	2 (4.1%)	6 (12.2%)	22 (44.9 %)	19 (38.8 %)	2.18 (4)
Webpage					
Conceptual	6 (12.2 %)	-	14 (28.6 %)	29 (59.2 %)	2.35 (2)
Practical	6 (12.2 %)	2 (4.1%)	10 (20.4 %)	31 (63.3 %)	2.35 (1)
Home page					
Conceptual	17 (34.7 %)	-	6 (12.2 %)	26 (53.1 %)	1.84 (4)
Practical	16 (32.7 %)	1 (2 %)	5 (10.2 %)	27 (55.1 %)	1.88 (5)
E-journals					
Conceptual	28 (57.1%)	-	7 (14.3 %)	14 (28.6 %)	1.14 (7)
Practical	30 (61.2 %)	2 (4.1%)	4 (8.2 %)	13 (26.5 %)	1.00 (6)
Search engines					
Conceptual	27 (55.1%)	1 (2 %)	4 (8.2 %)	17 (34.7 %)	1.22 (6)
Practical	7 (14.3 %)	1 (2 %)	10 (20.4 %)	31 (63.3 %)	2.32 (2)
Subject gateways					
Conceptual	43 (87.8 %)	2 (4.1%)	-	4 (8.2 %)	0.29 (9)
Practical	46 (93.9 %)	1 (2 %)	-	2 (4.1 %)	0.14 (9)

When they were asked to refine the search strategy using Boolean operators or combined/advanced searches, more than 87 per cent could not perform the search and only six could use the Boolean operators effectively (mean: 0.31). More than half of the students were unaware of performing searches through keyword (mean: 0.98) and subject searches (mean:0.96). A majority of them were good in identifying title keywords and could execute the search (mean: 1.98). For more than 85 per cent, identification of subject keyword was totally an alien thing, while for others, it was average performance (Table 6).

While a greater majority preferred web search tools, more than 53 per cent of the

students also access information on the web through institutional library webpages. A few students also looked for webpages of specialised digital libraries, subject gateways, and search service providers. More than two-thirds of the students took ten minutes or more to formulate and execute the search, irrespective of the number of terms the query had. Less than 20 per cent completed the task within five to ten minutes. Ten per cent of the students formulated and executed the search within five minutes (Table 7).

More than 90 per cent of the students made use of search services like Google and Yahoo. About four per cent preferred subject gateways. The students were unaware of metasearch engines like MetaCrawler and

Table 6. Search efficiency

Search Efficiency	Poor	Average	Good	Excellent	Mean
Number of terms	-	2 (4.1%)	47 (95.9%)	-	1.96
> 2 terms	15 (30.6%)	9 (18.4%)	14 (28.6%)	11 (22.4%)	1.43
2-5 terms	28 (57.1%)	4 (8.2%)	14 (28.6%)	3 (6.1%)	0.84
< 5 terms					
Hit results	38 (77.6%)	-	7 (14.3%)	4 (8.2%)	0.53
Use of Boolean operators	43 (87.8%)	-	3 (6.1%)	3 (6.1%)	0.31
Combined searches	43 (87.8%)	-	3 (6.1%)	3 (6.1%)	0.31
Keyword search	27 (55.1%)	-	18 (36.7%)	4 (8.2%)	0.98
Subject search	26 (52.1%)	2 (4.1%)	18 (36.7%)	3 (6.1%)	0.96
Title Keyword search	8 (16.3%)	2 (4.1%)	32 (65.3%)	7 (14.3%)	1.98
Subject Keyword search	42 (85.7%)	2 (4.1%)	5 (10.2%)	-	0.24

Dogpile. Once they executed a search, a majority of them got a very large hit results. When they were asked to select the appropriate title, 20 per cent took a decision by going through the title only, whereas more than 75 per cent did so by going through title and other details including the abstract, if available. Very few (N=2) took the decision arbitrarily (Table 7).

The students usually download the information from the web on a floppy disk (70 %). More than one-fourth of the students could not download the information due to virus problem and a few said downloading was not required for them. For many writing to a CD was a new concept, only two students were found capable of writing to a CD and they were unaware of the process of burning the CD. Nearly 60 per cent of the students were unaware of pdf/jpeg/gif files formats. When the supporting programmes required to open the files on the system were not available, the students concluded themselves that, the system or the floppy diskette have been affected by the virus.

5. DISCUSSION AND CONCLUSIONS

Recent developments in Information and Communication Technology (ICT), especially

the Internet and the Web, have brought significant changes in the ways one generates, distributes and accesses information. The students knew that www is the most advanced browsing system based on hypertext concept, which provides access to hundreds of databases and make information available to the user instantaneously. ICT can improve access to information, but in general, the information landscape is getting complicated than ever, with the advent of new sources and accessing methods. Information on Web does not have any target user community as such. The retrieval characteristics of Web information services are designed for the general audience and are different from traditional information retrieval systems.

The findings of the study have revealed many facts. Searching for relevant information on the Internet is often a laborious and frustrating task. It calls for some basic ICT and information literacy skills without which a search may never be fruitful. The findings also indicate that the students are familiar with the use of computer and Internet, but their level of knowledge of Internet, conceptually and practically varies. A majority of students under study who were using Internet had not been given any formal training, hence, their search efficiency also varied.

Table 7. Access to Internet

Access to Internet	Number	Percentage
Methods	26	53.1
Institution/Library web pages	2	4.1
Web pages of digital libraries	3	6.1
Subject gateways	4	8.2
Search service providers	46	93.9
Web search tools		
Duration of search	6	12.2
2-5 min	9	18.4
5-10 min	34	69.4
< 10 min		
Selection of appropriate terms	10	20.4
By going through title	37	75.5
By going through title and other details	2	4.1
Arbitrarily		
Choice of search service	45	91.8
Yahoo, Google	2	4.1
Subject gateways	2	4.1
Arbitrarily		
Downloading	13	26.5
Never download	34	69.4
On floppy	2	4.1
On CD		
Problems with file formats	29	59.2
Unaware	19	38.8
Aware and no problems	1	2.0
Aware and problem with downloading		

Studies focussed on user and novice-learner using survey and experimental methods observe a similar kind of situation. Studies reported^{3, 10, 17,19, 20-24} in a nutshell reveal that users find it difficult to formulate complex queries. In general, they spend very little time on searching, in most cases, they formulate very short and simple queries with one or two search terms, spend little time in looking at and deciding the usefulness or relevance of retrieved items, and very few queries contain advanced search features.

Nicholas and Fenton²⁵ argued for creating information tools and strategies to help users. Lazinger, review revealed the behaviour of Internet users calling for more studies to be augmented by experimental data in the context of theory building. Senkovitch and Wolfram²⁶,

Nahl²⁷, Meghabghab²⁸, Nahl and Harada²⁹, and James and Nahl³⁰, who have mapped user's behaviour on the web from the experimental-ethnographic and theory building approach have emphasised on creating user-friendly environment and controlled training programmes.

This certainly advocates for providing a regular and rigorous training programme by the Library Science Departments of Universities, particularly on how to find information on the Web. Students have to be trained, specially on how to formulate the search, viz., formulating the query, identifying the important concepts, keywords, Boolean searches, wildcard searches, use of parentheses, etc. Knowing how to conduct searches is a skill. With any search strategy, effective searching becomes a matter of matching the particular information needed, with a strategy that can answer it. Familiarity with the subject, search options, search service, and selection of appropriate search terms, yield better results.

This clearly indicates the fact that access to information on the Web is significantly influenced by the perceived disadvantages of those who are either unable, or do not choose to use the appropriate ICT to perform their activities, decision-making, and learning. And as such has a direct implication on digital and information literacy training, user education, and online help facilities including using search term dictionary or vocabulary control tools. Hence, a University library has to employ the following strategies to optimise its support services to the user community:

- ✘ Launch an awareness campaign, by arranging talks on topics such as Internet, Web, digital libraries, e-journals, etc describing their benefits and also how best to exploit them
- ✘ Facilitate and encourage development of basic ICT skills. To encourage acquiring such skills, users must be motivated to use the Internet. ICT skills can be acquired as users access the Internet for other purposes
- ✘ Introduce an information literacy programme to create awareness

- ✧ Regular onsite visits for follow ups and training

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