

Web-Based Information Retrieval Pattern of Medical Students

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Abstract

The purpose of this study was to assess the web-based information retrieval pattern of the students of Calicut Medical College, Kerala. Structured questionnaires were employed to collect data from a representative sample of 100 MBBS students. The study found that a majority of the students often use the web for communication and to get general information and recent advances in Medicine. A good number of the students use web-mail and social networking sites very frequently. All the students use simple search methods for accessing the web. Google is the most preferred search engine followed by Yahoo. Only a very few of the students use e-journals and databases. Lack of training/orientation, lack of computer infrastructure, lack of fulltext e-journals and low Internet backbone speed are the major reasons of underutilization of web-based information resources. The findings of this study would assist medical institutions in India to develop strategies and policies that could make better use of web-based information resources for medical education and research.

Keywords: E-Resources, Retrieval Pattern, Information Seeking Behaviour, Word Wide Web (WWW), Medical Students, Kerala

1. Introduction

The World Wide Web has greatly changed the way of accessing information and methods of learning. The web provides a wealth of medical information with the rapid growth of medical information websites on diseases, therapeutic procedure, self-care and pharmaceutical products. However, the web also hides several shortcomings such as uneven quality of medical information, difficulties in finding and understanding this information, and risks of over-consumption^{1,2}. There are many medical information websites and webpages on the Internet, written by individuals, institutions, organizations, universities, governments, etc with very heterogeneous backgrounds and intentions. The plethora of information available and the corresponding lack of organization of this information can be a barrier to medical students and teachers. They should be efficient to access and retrieve accurate and up-to-date information.

There is a growing need to assess and evaluate the web-based information retrieval pattern of students and to find out what factors affect their use of web-based information resources. The web is a convenient source of specific information which students are increasingly using to complete their assignments and projects³. As far as the information retrieval is concerned, the web enables students a more personalised approach to gain access to information. Majority of students explore the web without formal help and training. Exploring the web requires quite different knowledge and skills from those that required in a print and traditional library environment. The web as a whole is not well organized and retrieving focused information from the web is becoming increasingly complicated.

The Calicut Medical College was established in 1957 as the second medical college in Kerala. Since then the institution has grown into a premier center of medical education in the state. The present study attempts to assess the web-based information retrieval pattern of the students in Calicut Medical College.

2. Literature Review

Although there is already a rich and extensive body of literature investigating the information seeking and retrieval patterns in the electronic environment, this study attempts to assess the web-based information retrieval pattern of medical students. Liang and Tsai⁴ found that medical students with more Internet experience tended to utilize the 'elaboration' searching strategy while being oriented towards employing quite 'mixed' standards for judging online information. Lal⁵ and others observed that the use of the Internet for educational purpose was higher among the postgraduate medical students while use for chatting and entertainment was higher among the undergraduate medical students. Ward and Newlands⁶ conducted an experiment to investigate how exactly students use web-based information. The study revealed that most of the students just printed or copied the documents straight away from the computer without editing or even having read them to the end. Andrew and Robert⁷ found that a key factor in students' use of the web as an information resource was time and the students were not at ease with the information retrieval process from the web to provide a different perspective on the subject they were searching through the availability of links to related information. Most of the students had only a vague understanding of the way search engines work which resulted in a poor exploitation of their facilities. Students regarded that web-based resources were more up-to-date than traditional sources but they placed less trust in content. In another study, Grimes and Boening⁸ found that students were evaluating web-based resources only superficially and they were indeed using unauthenticated web resources. Cothey⁹ examined web users' information searching behaviour in higher education institutions to detect whether there was any change in an individual's web information seeking behaviour as that individual gains experience. The analysis revealed that users access the web often, which was more sporadically, as they become more experienced. Users relied on a passive link clicking or browsing style of information searching.

Bond¹⁰ found that the most successful way of finding the web documents was by the efficient use of search engines and a lack of understanding of the advantages of developing search strategies and poor searching skills were the main underlying factors for the successful retrieval of web documents. Islam and Panda¹¹ reported that web-based information was important for research work and traditional library and printed materials were more effective to researchers than web-based information resources. Khare, Thapa and Sahoo¹² in their study found that the rate of Internet use was more in research scholars of science, life science, engineering and management as compared to the research scholars of arts, social sciences, law, education and commerce. Among the non-users of Internet, the number of female research scholars was more as compared to male. The study conducted by Madhusudhan¹³ to assess the use of Internet by the research scholars of University of Delhi, India revealed that the major factors hampered the effective use of the Internet were inadequate computers with Internet facility, slow Internet connection and lack of skills and training. Biradar, Rajashekhar and Sampathkumar¹⁴ analyzed Internet searching behaviour of students and

faculty members of Kuvempu University. The study found that the main purpose of using Internet was study and teaching activities. Google and Yahoo were the preferred search engines. Lewandowski¹⁵ also found that the two major search engines, Google and Yahoo, perform best and participants approach them more frequently than other search engines. In a study to assess the online use and information seeking behaviour of UK researchers, Nicholas, Clark, Rowlands and Jamali¹⁶ found that research intensive universities were characterized by high volume use and short session times and sessions which utilized few of the search functions available. Open access journals featured strongly in the ranked lists of life sciences and history; and Google was an extremely popular means of accessing journal content.

In general, the use the Internet, information seeking and retrieval pattern in the web are studied and discussed at different levels. However, there seems to be very little research that assesses the web-based information retrieval pattern of medical students in developing countries like India. This study provides an insight into the current web-based information retrieval pattern of medical students in India. It is expected that the findings of this study would assist medical institutions in India to develop strategies, policies and future plans that could make better use of web-based information resources for medical education and research.

3. Methodology

The universe of the study was the 1000 MBBS students of the Calicut Medical College. Postgraduate medical students, BDS, nursing and other para-medical students were excluded from the study. Structured questionnaires were employed to collect data from a representative sample of 100 MBBS students at various times during the months of June to July 2010. The questionnaires were distributed to the students with a cover letter indicating the significance of the study and the intended plans for the results. In preparing the questionnaire, similar studies and previously drafted questionnaires in this area were consulted. A total of 97 filled in questionnaires were received back, which comes to a response rate of 97 per cent. The data collected through the questionnaires were converted into machine-readable form and imported into the statistical analysis package SPSS. The data were analysed and inferences were made based on standard statistical methods.

4. Results and Discussions

4.1 Place of Web Surfing

The students were asked to indicate the place(s) of access to web and the responses are summarized in the Table 1. It reveals that a majority (62.89 per cent) of the students often use Learning Resource Centre (LRC) of the College to access the Web. A good number of the students sometimes use LRC (43.02 per cent), Home (35.05 per cent) and Cyber Café (31.96 per cent). A few (21.65 per cent) students often use Cyber Café to access the Internet. It is found that a good number (41.24 per cent) of the students often use the web at home. The overall analysis revealed that the students prefer LRC to access the web.

Table 1 - Place(s) of Web Surfing

Place(s)	No. of responses (N=97)		
	Often	Sometimes	Never
LRC College)	61 (62.89%)	33 (34.02 %)	3 (3.09 %)
Home	40 (41.24%)	34 (35.05 %)	23 (23.71 %)
Cyber Cafe	21 (21.65%)	31 (31.96%)	45 (46.39 %)
Others	3 (3.09 %)	13 (13.40 %)	81 (83.50 %)

4.2 Time Spent for Accessing the Web

Table 2 shows the time that was taken by the students for accessing the web a day. It is found that about half (50.52 per cent) of the students use the web around 1-2 hours a day and a good number (34.02 per cent) of the students use the web more than two hours a day. A few (15.46 per cent) students access the web less than one-hour a day.

Table 2 - Time spent for accessing the web

Time	No. of responses (N=97)
Less than 1 hour	15(15.46 %)
1-2 hours	49(50.52%)
More than 2 hours	33(34.02 %)

4.3 Purpose of using the Web

The students were asked to indicate the purpose of using the web. The Table 3 shows that a majority of the students often use the web for communication (75.26 per cent) and to get general information and recent advances in Medicine (77.32 per cent). A good number of the students often use web for accessing clinical information and therapeutic guidelines (30.92 per cent) and for downloading files, images and programs (45.36 per cent). A good number (42.27 per cent) of the students indicated that they sometimes use the web for accessing clinical information and therapeutic guidelines and for downloading programs, files and images. A majority (71.13 per cent) of the students responded as never to the use of the web for carrier information.

Table 3 - Purpose of using the web

Purpose	No. of responses (N=97)		
	Often	Sometimes	Never
To get general information and recent advances in Medicine	75 (77.32 %)	20 (20.62 %)	2 (2.06 %)
Accessing clinical information and therapeutic guidelines	30 (30.93 %)	41 (42.27 %)	26 (26.80 %)
Carrier Information	7 (7.22 %)	21 (21.65 %)	69 (71.13 %)
Communication	73 (75.26 %)	24 (24.74 %)	-
Downloading programs/files /images	44 (45.36 %)	41 (42.27 %)	12 (12.37 %)

4.4. Use of E-journals

The students were asked to indicate the use of e-journals and the responses are summarized in the Table 4. A good number (36.08 per cent) of the students often use Calicut Medical Journal. A few (22.68 per cent) students use ScienceDirect often. A good number of the students sometimes use ScienceDirect (32.99 per cent) and Calicut Medical Journal (39.17 per cent). It is found that a majority of the students never use e-journals. A very few (7.22 per cent) students indicated that they use MD Consult Online Journals and Journal of Orthopaedics.

Table 4: Use of e-journals

E-journals	No. of responses (N=97)		
	Often	Sometimes	Never
ScienceDirect	22 (22.68 %)	32 (32.99 %)	43 (44.33 %)
MD Consult Online Journals	7 (7.22 %)	14 (14.43 %)	76 (78.35 %)
Journal of Orthopaedics	7 (7.22 %)	16 (16.49 %)	74 (76.29 %)
Calicut Medical Journal	35 (36.08 %)	38 (39.17 %)	24 (24.74 %)

4.5 Use of Databases

The students were asked to indicate the use of databases and the responses can be seen from the Table 5. It is found that a few students often use PubMed (18.56 per cent), ProQuest (13.40 per cent) and Medline (21.65 per cent). A good number of the students indicated that they sometimes use PubMed (30.93 per cent), ProQuest (34.02 per cent) and Medline (42.27 per cent). A good number of the students preferred the option never to the listed databases.

Table 5 - Use of databases

Databases	No. of responses (N=97)		
	Often	Sometimes	Never
PubMed	18(18.56 %)	30(30.93 %)	49(50.51 %)
ProQuest	13(13.40 %)	33(34.02 %)	51(52.58 %)
Medline	21(21.65 %)	41(42.27 %)	35(36.08 %)

4.6 Frequency of Use of Web-based Communication Resources

The students were asked to indicate the frequency of use of various communication tools/utilities/services. It can be seen from the Table 6 that a good number (36.08 per cent) of the students use web-mail and social networking sites such as Orkut very frequently. A very few students use YouTube (12.37 per cent) and Blog (7.21 per cent) very frequently. A good number of the students frequently use web-mail (29.89 per cent) and social networking sites (28.86 per cent). Twenty-two (22.68 per

cent) students use Blog as and when required. A good number of the students occasionally use web-mail (27.83 per cent), YouTube (30.92 per cent), and social networking sites (28.86 per cent). A few students use RSS (14.43 per cent) and Blog (16.49 per cent) occasionally.

Table 6 - Frequency of use of web-based communication resources

Communication resources	No. of responses (N=97)				
	Very frequently	Frequently	Occasionally	As & when required	Never
Web-mail	35 (36.08%)	29 (29.89%)	27 (27.83%)	6 (6.18%)	-
RSS	-	5 (5.15 %)	14 (14.43%)	13 (13.40 %)	65 (67.01 %)
Social networking sites	35 (36.08%)	28 (28.86 %)	28 (28.86 %)	5 (5.15 %)	-
Blog	7 (7.21 %)	10 (10.30 %)	16 (16.49 %)	22 (22.68 %)	42 (43.29%)
YouTube	12 (12.37%)	13 (13.40 %)	30 (30.92 %)	14 (14.43%)	28 (31.95 %)

4.7 Frequency of using search engines

The use of web search engines has become common place among web users, and is increasingly being used in all aspects of society¹⁷. As the amount of information on the web continues to grow, web-based information resources will continue to be a primary source by which users find information. The students were asked to indicate the search engines used and the responses are summarized in the Table 7. A few students use Google (25.77 per cent) and Yahoo (13.40 per cent) almost every day. All the students responded no to AltaVista and Entrez search engines. A few students use Google (25.77 per cent) and Yahoo (20.62 per cent) two or more times a week. Google and Yahoo are the main search engines used and a good number of the students also use MSN search. It is noted that Entrez, a powerful federated search engine that allows users to search many discrete health science databases has got no use among the students.

Table 7 - Frequency of using Search Engines

Search Engines	No. of responses (N=97)					
	Nearly once a month	Two or more times a month	About once a week	Two or more times a week	Almost every day	No use
Google	9 (9.28 %)	25 (25.77 %)	13 (13.40 %)	25 (25.77 %)	25 (25.77 %)	-
Yahoo	12 (12.37 %)	13 (13.40 %)	27 (27.84 %)	20 (20.62 %)	13 (13.40 %)	12 (12.37 %)
MSN search	22 (22.68 %)	17 (17.52%)	9 (9.28 %)	9 (9.28 %)	-	40 (41.24 %)
AltaVista	-	-	-	-	-	97 (100 %)
Entrez	-	-	-	-	-	97 (100 %)

4.8 Frequency of Using Different Search Methods

Most search engines allow for the use of Boolean operators in searches. Boolean logic allows users to limit searches to specific phrases rather than simply keywords, to exclude irrelevant terms or phrases from searches. The respondents were asked to indicate the frequency of different search methods used for retrieving information from the web. Table 8 indicates that all the students often use simple search methods for accessing and retrieving web-based information resources. The students are not very good at searching the web. One of the reasons is that most of the students do not know how to search the web effectively. All the students indicated that they use simple keywords for searching the web. A very few of the students often use field searching (10.31 per cent) and phrase searching (8.25 per cent). A few (25.77 per cent) students use Boolean operators for searching the web. A good number of the students sometimes use field searching (31.96 per cent) and Boolean operators (45.36 per cent). No one use truncation of search terms for searching the web.

Table 8 - Frequency of using different search methods

Searchmethods	No. of responses (N=97)		
	Often	Sometimes	Never
Simple	97(100 %)	-	-
Boolean	25(25.77 %)	44(45.36 %)	28(28.87 %)
Truncation	-	-	97(100 %)
Field searching	10(10.31 %)	31(31.96 %)	56(57.73 %)
Phrases	8(8.25 %)	22(22.68 %)	67(69.07 %)

4.9 Satisfaction with web-based Resources

The students were asked to indicate what extent they were satisfied with web-based information resources. They were provided three options to indicate their responses. The Table 9 shows that 35 (36.08 per cent) students indicated that they are satisfied with web-based information resources. A good number (46.39 per cent) of the students are not satisfied with web-based information resources. A few (17.53 per cent) students responded as partially satisfied. The students are not successful in exploiting the web. Most of them do not know how to use the web effectively.

Table 9 - Satisfaction with web-based resources

Satisfaction	No. of responses (N=97)
Satisfied	35(36.08 %)
Partially satisfied	17(17.53 %)
Not satisfied	45(46.39 %)

4.10. Reasons for under utilisation of web-based resources

The questionnaire listed four possible reasons of under utilization of web-based information resources. The students were asked to mark all the items they considered applicable in their cases. The responses can be seen from the Table 10. There are different reasons that hampered the use of web-based information resources by the students. All the students indicated that lack of training and orientation is the topmost reason of underutilization of web-based resources. A majority of the students responded 'yes' to low internet backbone speed (76.29 per cent), lack of computer infrastructure (72.16 per cent) and lack of fulltext online journals (83.51 per cent).

Table 10 - Reasons of underutilisation of web-based resources

Reasons of underutilization	No. of responses (N=97)
Low internet backbone speed	74(76.29 %)
Lack of computer infrastructure	70(72.16%)
Lack of fulltext online journals	81(83.51 %)
Lack of training/orientation	97(100 %)

5. Conclusion

This investigation has provided a useful summary of the web-based information retrieval pattern of the students in Calicut Medical College. Findings of the study revealed that the Internet access, computer infrastructure and e-resources such as e-journals and databases are not adequate in the Calicut Medical College. These are the main reasons of underutilization of web-based information resources. Many students are therefore missing the opportunity to avail themselves of the many web-based information resources that could benefit them academically. Improved access to relevant information will reflect in an increase in the productivity of the students.

Therefore, immediate steps should be taken to provide state-of-the-art computer infrastructure with full-fledged Internet access in the departments and central library. The medical students should be trained to extract valuable information from the web and should be encouraged to check the authenticity of information by correlating with existing evidences¹⁸. The students should be taught to use a variety of searching methods and strategies when exploring the web. Search methods and strategies are very important and merely using search engines haphazardly should be avoided. They should know how to narrow down a search by filtering unwanted information using the best search terms. They should be made more aware of the many web-based information resources that can benefit them academically. They should be encouraged to use official websites of reputable institutions, consortia, e-journals and publishers. They should be able to locate, describe and justify a website with specific relevance to their information requirements. They should develop critical selection and analytical skills for locating, selecting and incorporating relevant information into their

studies. Once this level of skills is achieved the knowledge-acquisition process can be significantly speed up¹⁹.

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