

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

---

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

---

2021

## Internet Information Retrieval Experiences and Challenges of Aga Khan University Library Users

Nasra Gathoni  
nasragathoni@gmail.com

Follow this and additional works at: <https://digitalcommons.unl.edu/libphilprac>



Part of the [Library and Information Science Commons](#)

---

Gathoni, Nasra, "Internet Information Retrieval Experiences and Challenges of Aga Khan University Library Users" (2021). *Library Philosophy and Practice (e-journal)*. 6489.  
<https://digitalcommons.unl.edu/libphilprac/6489>

# INTERNET INFORMATION RETRIEVAL EXPERIENCES AND CHALLENGES OF AGA KHAN UNIVERSITY LIBRARY USERS

Nasra Gathoni  
Aga Khan University  
[nasra.gathoni@aku.edu](mailto:nasra.gathoni@aku.edu)

## **Abstract**

This study reports on internet information retrieval experiences and challenges of Aga Khan University library users. The unit of analysis was obtained through a purposive sampling method and data collected using a structured questionnaire. The data was quantitatively analyzed and descriptive statistics provided. 87% (52/60) of the members in the sample completed and returned the questionnaire. 83% indicated that they had prior computer skills and 52% had training in Internet searching. 35% of the respondents who did not use any of the search techniques indicated, was noted. Gender did not appear to affect use the retrieval of information vis-a-vis use of Internet. There was a difference in the user categories with regards to the use of the Internet for information retrieval. The workstation was indicated as the most convenient location to access the internet. However, different categories gave a different indication. In conclusion, there appears to be lack of optimal utilization of the internet resources available. Lack of knowledge on the use of the search techniques and facilities is noted. The study recommends continuous training of Aga Khan University library users on internet searching and basic computers skills, to enhance utilization of relevant internet information resources.

## **Keywords**

Internet; Online databases; Information retrieval; Search techniques

## **Introduction**

It is generally known that the Internet has become a major source of information. Though the Internet has created the information overload phenomenon it still remains an important tool for information. In their review study, Kobayashi and Takeda (2000) show that about 85% of web users surveyed claim to be using search engines or some kind of search tool to find specific information of interest. It is clear from this study that the Internet and especially search engines are a major tool that help in finding information. They add that with the enormous volume of web pages in existence it's no wonder the search engines are used to find specific information.

With the ever-increasing volume of information on the Internet, the diversity of content and enormous volume of information on the Internet, retrieving relevant information may be far from assured. Google is an example of a search engine which has indexed over 8 million pages. Spink and Saracevic (1997), suggest that there is need to concentrate more research on information retrieval interactions. This can also be used to improve information retrieval processes. In his study, Carlson (2003) states that “user empowerment is greatly augmented by knowing the strengths and weaknesses of several search engines... [and databases] and being able to deploy them in an effective manner”. He adds that user benefits from search engine technology have been critically degraded over time by the rapid increase of Internet pages. It is important for users to redefine their information needs and processing habits and also the need to learn to navigate successfully “in an excessively information rich environment” In order to maximize on the retrieval of information from the Internet, users must be equipped and skilled in informational retrieval. The Internet has enormous quantity of information. The two questions that face any information seeker are 1) How can I find what I want? and 2) How can I know what I find is any good? (Harris, 2000). This study attempted to answer the first question.

The Aga Khan University library has different categories of users. The main users include nurses and doctors. Though the users are from different categories, they have one similarity, which is seeking information relating to patient care. This calls for accurate information that is credible and up to date. Emphasis is placed on the health related

databases due to the work role of the aforementioned core users. More so, evidence-based medicine (EBM) has become a focus for improving healthcare and the essence of EBM is decision making influenced by best available evidence. Some vital resources available through Aga Khan University Library that can be used to improve healthcare include, Medline, Cochrane, UpToDate, Hinari, CINAHL, among others.

### **Objective**

The main objective of this study was to investigate experiences and challenges of internet information retrieval of Aga Khan University library users.

Specific objectives of the study were:

- To assess Aga Khan University library users' internet sources of information
- To investigate Aga Khan University library users' knowledge of internet information retrieval methods and techniques.

### **Research questions**

The study was based on the following research questions:

- Do demographic factors affect how users retrieve information from the Internet?
- What internet sources of information do Aga Khan Library users utilize?
- Are Aga Khan Library users aware of information retrieval techniques available for internet information retrieval?

### **Rationale of the study**

“The information age has produced a wealth of information.” Information has grown and this has increased the amount of information accessible. This wealth of information can be overwhelming (Chen, 1998), hence bringing about a subjective and objective phenomenon of information overload. Objectively, the amount of readily available information has increased and may continue to increase. It is subjective from the point of having more information available than we can readily assimilate (Carlson, 2003). Investigating the level of knowledge, skills and experience of users on Internet search techniques is therefore essential. The information seeking behaviour of the users was also examined to include the barriers to online information. The data collected may inform

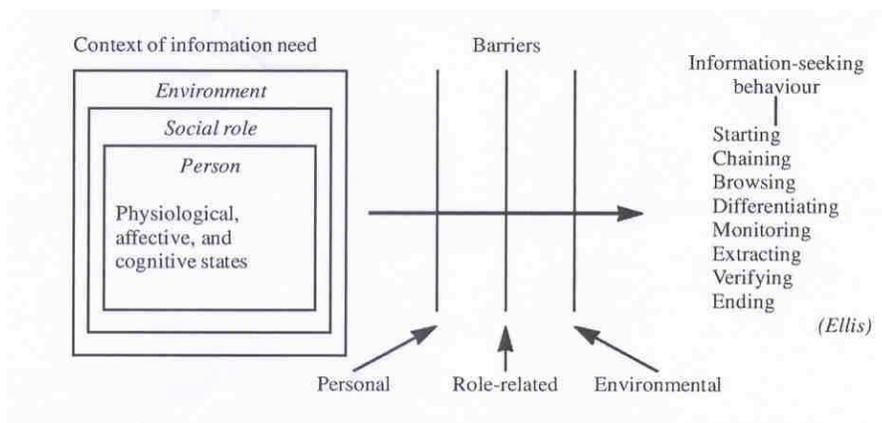
librarians on factors and problems related to Internet information retrieval and hopefully provoke conversations on how to help identify effective methods of assisting the users.

## Literature review

### Information seeking behaviour of nurses and doctors

Professionals such as nurses and doctors “need a wide variety of health information to meet their clinical and education needs” (Cheryl, 2005). The study by Cheryl revealed that, though nursing students and clinical nurses use databases such as CINAHL (96%) and MEDLINE (40%), they indicated various deterrents such as lack of overall computer skills (84% clinical nurses; 20% nursing students), insufficient time for searching (28% nursing students; 76% of clinical nurses), lack of database training (8% nursing students; 76% clinical nurses)

As Leckie (1996) indicates, “in order to investigate the information seeking behaviours, the broader working context in which professional practice is conducted must be closely examined and understood.” It is important to examine in depth the details of the work. In the information needs of doctors, for example, this would vary from one doctor to another and this variation may be according to their specialties e.g. surgeons, paediatricians, pathologists, internists etc. Wilson (1999) proposed an information model of information seeking behaviour, which is appropriate in explaining the information seeking behaviour of doctors and nurses.



**Fig 2 Wilson's model of information seeking behaviour**

Wilson (1999) explains that user behaviour includes concepts such as reading habits, information usages, information seeking. Factors affecting information seeking include: sources of information; types of channels or formats; awareness of information. Other factors that influence include, trustworthiness, packaging, timeliness, accessibility. According to Gruppen (1990) factors that would influence the information sources which physicians use include “physician characteristics e.g. age, experience and specialty; practice characteristics, including community size, practice type, and setting; and the availability of specialists, colleagues, and educationally influential physicians or opinion leaders. Age difference may be due to differences in the level of experience.

Lee (2005) clearly explains Wilson’s model by indicating that information seeking behaviour is triggered by physiological, affective and cognitive needs. Affective in this study would apply to the need to attain education or academic qualifications. Doctors and nurses also have cognitive needs such as the need to learn new technologies and skills and to keep abreast with the latest health information. The model further explains that the motivation to seek information may be hindered by personal, interpersonal and environmental factors. Wilson’s model is therefore applicable in this study as it is important to understand the information seeking behaviour of users and the retrieval aspect can be guided by the model.

### **Internet Information Retrieval**

The World Wide Web is the largest and fastest growing activity on the Internet. As the Internet expands constantly the more important is the role of search engines in the retrieval of information. Many users seem aware that search engines vary in size and coverage and also in their functionality features e.g. search options. However, many users “do not know about differences in the way engines index web documents.” The knowledge is important to achieve the desired recall and precision (Mettrop & Nieuwenhuysen, 1998). Apart from the increase of information in this information age an additional problem is the “relative decline in relevancy or pertinence of returned documents”. In order to deal with information overload, it is important to understand the internet as a source of information. Users tend to have expectations of what is available on the Internet to the extent of thinking that any information required is available.

According to Carlson (2003) this is not the case due to what is referred to as the Deep Web or Hidden Web. Therefore, what is retrieved are static pages, pages on major domain servers or those linked by other pages.

There are however obstacles that may affect proper retrieval of internet information. A study by Jerome (2002) indicates that some of the obstacles include, lack of time, not knowing where to search for information, search techniques such as narrowing the search without missing relevant information, availability of resources. Cullen's study of 2000 (as quoted by Cullen, 2002), suggested that barriers to effective use of Internet as a source of information included access problems, relevant skills. Young (1999), in his Australian study of 1999 on use of evidence database by general practitioners showed that users may be aware of the resources but do not use them. The study showed that 22% of the physicians were aware of Cochrane library yet only 4% used it. With regards to demographics, there are studies that suggest age and gender may affect how one uses the Internet for information (Cullen, 2002). The study by Cullen (2002) showed that 67.1% of male used the Internet while a lesser percentage (32.8%) of female used it. The study also showed that users confused the difference between a database and a search engine and this could probably affect where one sources for information. Respondents listed MEDLINE, BMJ, Cochrane as the medical search engines used (p.373). The study also showed varied search skills with some having basic knowledge of searching and aware of the need to be as precise as possible when stating the search query.

Users are faced with the problem of retrieving valuable information by "fishing it out of a huge sea of neither regulated, nor guaranteed, dynamic data" (Landoni & Bell). Quality in information retrieval is evaluated by precision vs. recall. Precision is defined as the "ratio of relevant documents to the number of retrieved documents", and recall is "the proportion of relevant documents that are retrieved". (Kobayashi & Takeda, 2001). Users need to apply queries that create an optimal balance between recall and precision, for example, use of Boolean operators, use of specific terms, use of synonyms to expand a search etc. (Carlson, 2003). A lot of information retrieval studies have focused on measuring the relevant number of documents using recall and precision (Hersh, 2002; Dumais, 1991; Shaw, 2004). It is however important to also focus on whether users are

aware of the techniques available for information retrieval. Without adequate knowledge of the search techniques the achieving optimal balance on the recall and precision may become difficult to achieve. Ubiquitous and pervasive yet easily accessible, the web appears to have instant answers to any type of question. With thousands of responses to every question it may on the other hand offer no clear answer to the information seeker, whose “quest leads ever deeper into the vastness of undifferentiated knowledge” (Gaudinat, 2006).

An article by Harris, (2000) indicates that “before searching for information on the Internet one needs to understand how information is stored and accessed on the web”. He gives 3 categories of information on the web: the free, visible web; the free invisible web; paid databases over the web. Carlson (2003), suggests the most important step in dealing with information overload is to achieve a better understanding of the Internet as an information resource. It is important to also understand what is referred to as Deep Web or Hidden Web as there is different kind of information available. For example, “more than half of the deep web content resides in topic specific database” (Bergman, 2003). This shows that one needs to use various resources to get information. The retrieval of available and relevant information should therefore not be limited to the use of a single search engine. Different search engines employ different tools to optimize retrieval results. It’s important to understand how they work.

According to Dumais (1991), the tremendous variability in the words used to describe objects of interest is a major barrier to successful retrieval of information from sources such as the Internet. The diversity in words used to describe same concepts can result in missing relevant articles. This is because the searcher may use different words from the author or indexer of the information. This problem of “mismatch between the searcher’s language and that of the target information” is not evident in the traditional method of information retrieval using books. Fundamental characteristics of human verbal behavior is believed to underlie these retrieval difficulties. Effective information retrieval implies that only relevant information is retrieved from the mass of available information, i.e. information that satisfies a specific information need” (Technikon SA, 2001).

## **Methods of minimizing errors in searching**

“Searching is characterized as a process in which a user describes a request via a query and the system must locate information that matches or satisfies the request” (Chen, 1998). Basic functions and features for online text retrieval were developed in the 1960s (Bellardo, 1998). The goal of search capability therefore is to match user’s specified information need with items in a search engine or database that will answer it (Hahn, 1998). Emphasis is placed on the retrieval features in order to have the ability to match a query to the tool for optimal results i.e. retrieve relevant articles (Cohen, 2001). The aim of the search techniques vis a vis retrieval features is to optimize the ability to identify relevant articles and to exclude irrelevant articles. Search strategies can be evaluated by the recall i.e. relevant literature retrieved or precision i.e. extent to which records retrieved are found to be truly relevant (Shaw, et al. 2004). Hence, the aim of literature searching is to optimize between the relevant and irrelevant articles (Shaw, 2004). Retrieval of information electronically depends on a “lexical match” between the words researchers use and those in the database. “Typically only text objects that contain one or more words in common with those in the users’ query are returned as relevant.” Synonymy and polysemy are some of the problems associated with retrieval of irrelevant material. Synonymy is whereby different words can be used to describe the same object or concept while polysemy refers to the same word having more than one meaning e.g. a search on ‘aids may retrieve information on the disease and also teaching aids (Dumais, 1991).

Different databases and search engines offer different information retrieval options. It is important to appreciate the great variation in the structure, access language and subject content of the various online databases and search engines. This has put the library users in a situation whereby users can access information but lack retrieval techniques skills i.e. the skills to perform, or try to execute a search. Use of search techniques such as Boolean operators, proximity, truncation etc are important in retrieving information with optimal balance in the recall and precision. Other retrieval features such as advanced search option, field specification, and controlled vocabulary are important in retrieving relevant information from the Internet. “The goal of a search capability is to match a user’s specified information need with items in a database that will answer it”. There are search

capabilities that “specify the relationship between terms” and those that “facilitate the interpretation of a particular word” (Bellardo, 1998). The search capabilities that specify the relationship between terms include Boolean logic and proximity. Those that facilitate the interpretation of a particular word include truncation and nesting. Boolean logic, named after British-born Irish mathematician George Boole (1815 – 1864), refers to “the logical relationship among search terms.” George Boole wrote on how to “formulate precise queries using true-false connectors or ‘operators’ between concepts” in a logical way. The nature of Boolean logic can be compared with “binary logic used in digital computers” and “has become the conventional basis for searching most computerized systems” (Boolean searching...2002). Search terms can be combined using logical operations in many databases (Tyner, 2001). The words AND, OR, NOT represent the basic Boolean operators. Truncation is the use of a symbol at the end of a word to retrieve variants of the word. Nesting can be used together with Boolean operators. It involves the using of parentheses as “an effective way to combine several search statements into one search statement” (Internet Basic, 2002). The terms in the parentheses are searched first and then combined with those outside the parentheses. “When more than one element is in parentheses, the sequence is left to right” (Boolean searching..., 2002).

## **Research Methodology**

### **Study Design**

A quantitative design was used in this study to describe the knowledge of the Aga Khan University library users on the Internet search techniques and the factors and problems related to Internet information retrieval.

### **Study Setting**

The study was conducted at the Aga Khan University, Kenya campus. Aga Khan University is one of the private universities in Kenya and is located in Nairobi. It is a philanthropic, not for profit, private teaching institution committed to providing the best possible option for diagnosis of disease and team management of patient care. The Aga Khan University Library is committed to the mission of supporting the functions of the university to realize quality education and health services. Towards this goal, the library acquires and makes available current resources in all formats to the users. The Library

acknowledges limitations of collection development and as a result, emphasis is put in the exploitation of online resources vis-a-vis Internet.

### **Population, Sample and Sampling**

The population constituted nurses and medical doctors. The study focused on Bachelor of Science nursing students, the nursing faculty, medical faculty and the medical postgraduate students. These are considered the main users of the Aga Khan University library.

A sample of 60 users was drawn from the population using a purposive sampling method. Of the nursing population, 20 nursing students and 10 nursing faculty members were drawn from the sample. As for the medical doctors, 20 medical postgraduate students and 10 medical faculty members were drawn from the sample.

### **Instrument of Data Collection**

The data collection instrument for the study was a questionnaire. The questionnaire was chosen as it appeared to be the best in terms of feasibility where time is limited. Questionnaires can also reach a number of people simultaneously. The questionnaire applied close ended-questions. Structured questionnaires which indicate a range of possible answers (Bless & Higson-Smith, 2000:118), are also referred to as closed as they “do not elicit unpredictable responses” (Busha & Harter, 1980:70). These enhance reliability, are simple to record and allow comparison.

To reach targeted numbers the faculty members were handed the questionnaire in their work stations and offices. The questionnaire was also given to students as they visited to the library. There was follow up by use of telephone to maximize on the return of questionnaires.

Demographic data of the users was collected as a measure to control the threats to internal validity. This included age, gender, academic status. The demographic data was used to identify the response sets between the different user groups. The importance was to see whether responses are consistent across the users.

## Data Analysis Procedure

The recorded data from the questionnaire was quantitatively analyzed giving descriptive statistics.

## Data Analysis and Discussion

### Response rate

52 questionnaires were received from the users, that is, 87% response rate. The response rate from the students was higher than that from the faculty; 37 from nursing and medical students (93%,  $n=40$ ) and 15 from nursing and medical faculty (75%,  $n=20$ ). In the individual categories, there was 100% response rate from the nursing students, 85% response rate from the medical students, 60% response rate from the nursing faculty and 90% rate from the medical faculty.

### Demographics

The study sought to find out the demographics of the respondents, that is, gender, discipline and designation. Besides respondents either being nurses or doctors the designation assisted to show those that were in the category of students and those who were faculty. The age of the respondents was also included.

Table 1 shows a total of 22 (42%  $n=52$ ) male respondents and 30 (58%  $n=52$ ) female respondents. There were however more female respondents among the nursing students and nursing faculty than male respondents; 20 (77%,  $n=26$ ) and 6 (23%,  $n=26$ ) respectively. The medical students and faculty were 16 (62%,  $n=26$ ) male respondents and 10 (38%,  $n=26$ ) were female respondents.

**Table 1. Gender of Respondents**

Gender	Nursing Student	Nursing Faculty	Medical Student	Medical Faculty	Total
Male	5	1	9	7	22
Female	15	5	8	2	30
Total	20	6	17	9	52

The age of the respondents ranged from 25 – 55 years. The age of the students ranged from 25 – 35 years, and for the faculty ranged from 40 – 55 years. The question on age was difficult to analyze since a number of the respondents did not indicate their age.

Age may affect how one uses the Internet. This may be explained by the general knowledge that the ‘younger’ users may have been exposed to computers early compared to the older respondents who may have been first exposed to the computer at the work place.

### **Users with prior computer skills**

Table 2 shows number of respondents who had prior computer skills before joining the university. The table shows 43 (83%) of the respondents had prior computer skills and 9 (17%) had no prior computer skills before joining the university. Those who had training had received the training from school, college, or previous university. However, only 52% had undergone training on Internet searching and 48% had not undergone training on Internet searching. The study showed 13 nursing students (65%,  $n=20$ ) had no training on Internet searching.

Majority of the medical faculty had their first encounter with a computer at the work place compared to the students who indicated that they had used computers in schools and colleges. It appears that the younger user groups had been exposed to computers early and this may be because the technology already existed. As earlier mentioned, respondents ranged in age between 25 – 60; 25 – 30 for nursing students, 35-50 for nursing faculty, 25 – 30 for medical students and 40 – 55 for the medical faculty.

**Table 2. Users with prior computer skills**

<b>User Category</b>	<b>YES</b>	<b>NO</b>	<b>Total</b>
<b>Nursing Student</b>	13	7	20
<b>Nursing Faculty</b>	6	0	6
<b>Medical Student</b>	17	0	17
<b>Medical Faculty</b>	7	2	9
<b>Total</b>	43	9	52

### **Users who had undergone training on Internet searching**

The study showed that more medical students had undergone training in Internet searching than the nursing students. Table 3 shows that while 7 (35%) of nursing students had training and 13(65%) had no training, for the medical students 11(65%) had training and 6(35%) had no training.

**Table 3. Users with training on Internet searching**

<b>User category</b>	<b>Yes</b>	<b>No</b>	<b>Total</b>
<b>Nursing Student</b>	7	13	20
<b>Nursing Faculty</b>	5	1	6
<b>Medical Student</b>	11	6	17
<b>Medical Faculty</b>	4	5	9
<b>Total</b>	27	25	52

### **Search engines and databases used for information**

The question on search engines and databases used provided options to various search engines, evidence-based and point of care databases. Inclusion of evidence based databases was necessary as access to evidence based information is advocated in healthcare. The databases selected for the question were specific to those available through the Aga Khan University library.

The study found that Hinari and Medline databases were the most used and the highest usage of the databases was by the medical students. The low usage of CINAHL which is a database mainly for nursing publications was noted with only 1 nursing faculty indicating he/she uses the database. The usage of CINAHL being 4% ( $n=26$ ) of the number of nurse respondents. Other databases with low usage included EBSCO. The study however showed that search engines such as Google and Yahoo were highly used. The high use of search engines compared to evidence based databases suggests lack of understanding of the sources and nature of information they contain. This problem can be resolved through “proactive intervention by...information professionals.” Lack of maximum utilization of evidence based resources may mean that the quality of information retrieved from the Internet “is less than optimal”. Functions such as

keywords rather than ‘use of MeSH and subheadings suggest that respondents may not be finding the best evidence they could’ (Cullen, 2002).

**Table 4. Databases used for information**

User category	Hinari	Medline	CINAHL	EBSCO	UpToDate	Cochrane	None	Total
Nursing Student	10	5	0	0	1	3	8	27
Nursing Faculty	5	5	1	1	0	3	0	16
Medical Student	13	17	0	1	7	7	0	46
Medical Faculty	8	7	0	0	3	6	0	24
<b>Total</b>	36	34	1	2	11	19	8	111

*Respondents could select more than one database. The totals are therefore higher than the number of respondents but show the most highly used databases by user category.*

### Most convenient point of access

With regard to which is the most convenient location for accessing information, Table 5 shows the work station as being the most convenient with 21 (40%) respondents. Other access points were Office 14 (27%); library 14 (27%); home 2 (4%) and other locations such as cyber cafés 1 (2%). With regards to the different user categories 14 (70%,  $n=20$ ) of the nursing students indicated that the library was the most convenient access point; 6 (100%,  $n=6$ ) of nursing faculty indicated the office; 14 (82%,  $n=17$ ) of the medical students indicated the workstation and; 5 (56%,  $n=9$ ) of the medical faculty indicated the office.

**Table 5. Most convenient access point for users**

Access point	Nursing Student	Nursing Faculty	Medical Student	Medical Faculty	Total
Work station	4	0	14	3	21
Office	1	6	2	5	14
Home	0	0	1	1	2
Library	14	0	0	0	14
Other	1	0	0	0	1
<b>Total</b>	20	6	17	9	52

### Reasons for using Internet

The study aimed to find out the reasons users accessed the internet. Table 6 shows that 83% ( $n=52$ ) used the Internet for literature search; 13% for email, 2% used Internet for chat groups and 2% indicated 'other'.

**Table 6. Reasons for using the internet**

Reason	Nursing Student	Nursing Faculty	Medical Student	Medical Faculty	Total
Email	3	0	2	2	7
Chat group	0	0	1	0	1
Literature search	16	6	14	7	43
Other	1	0	0	0	1
Total	20	6	17	9	52

### Use of search techniques

The study aimed to find out the experience and knowledge of users search methods and techniques. Table 7 shows the largest number of respondents 18 (34.7%;  $n=52$ ) indicating none of the above, meaning that they had not applied any of the techniques. 31 % (16) used natural language; 27% (14) applied field specification; and 25% (13) applied Boolean logic.

It is evident from the study that the users are not maximizing on search techniques available, and training may be considered. Though the study indicates that 83% of the respondents had prior computer skills and 52% had training on Internet search, the lack of skills required to search databases reveal that "their skills required significant enhancement to adapt them" to databases such as Medline, Hinari, Cochrane etc. (Dee, 2005).

**Table 7. Search techniques used**

Search techniques	Nursing Student	Nursing Faculty	Medical Student	Medical Faculty	Total
Boolean Logic	1	3	8	1	13
Proximity Op.	0	3	2	1	6
Nat. Language	5	1	7	3	16
Controlled Voc.	1	1	3	1	6
Field Specification	1	3	5	5	14
Other	1	0	0	0	1
None of the above	11	2	2	3	18
<b>Total</b>	20	13	27	14	74

*Respondents could select more than one search technique. The totals are therefore higher than the number of respondents.*

### Use of search engines and databases search functions

Different search engines and databases provide search functions such as limits, related articles, MeSH, Boolean etc. The study showed that keyword searching was the most used with 34 (65.4%,  $n=52$ ) response. Those who had not used any of the search functions constituted 12% of the respondents. The different search functions used are shown in Table 8.

**Table 8. Use of available search functions**

Search functions	Nursing Student	Nursing Faculty	Medical Student	Medical Faculty	Total
Keyword search	10	4	15	5	34
Apply limits	0	3	5	1	9
Boolean	1	3	8	2	14
Related article	2	1	5	2	10
MeSH	3	3	7	2	15
None of above	5	1	0	0	6
<b>Total</b>	21	15	40	12	88

*Respondents could select more than one search functions. The totals are therefore higher than the number of respondents.*

## Barriers to electronic searching

The study sought to find out the barriers to online resources, or rather, the challenges users encounter when trying to retrieve information via the internet. Table 9 shows 48% of the responses indicated that slow speed of the Internet was the major barrier to electronic searching. 38% indicated lack of free time from work was a barrier, 29% indicated that they lacked computers to carry out the searches, 25% indicated lack of search skills as one of the barriers. With only 1 (2%) indicating information not needed, it is apparent that information from the Internet is essential and required by all users. Though 48% had indicated that they had no training on Internet searching as shown in Table 3, only 12% indicated lack of training as a barrier. The study also indicated lack of access to databases full text articles as a barrier.

**Table 9. Barriers to electronic searching**

User category	Information not needed	No free time	Lack of computer	Lack search skills	Lack of training	Speed	Other	No response	Total
Nursing Student	0	4	8	6	3	4	0	1	26
Nursing Faculty	0	0	0	0	0	3	0	2	5
Medical Student	1	11	6	3	1	12	3	0	37
Medical Faculty	0	3	1	4	2	6	0	1	17
<b>Total</b>	<b>1</b>	<b>18</b>	<b>15</b>	<b>13</b>	<b>6</b>	<b>25</b>	<b>3</b>	<b>4</b>	<b>85</b>

*Respondents could select more than one barrier. The totals are therefore higher than the number of respondents.*

## Conclusion and Recommendation

The study showed gender as having no effect on the use of Internet for information retrieval. The different categories vis-a-vis the academic status varied. The also study showed more medical students utilizing the Internet and applying the search techniques than the nursing students.

The results of this case study suggest that the Aga Khan University Library users need training in searching information on the Internet and ensure the utilization of all available evidence based resources. The prior knowledge of computers did not seem to improve on

the utilization of the Internet. The nursing students appear to be under utilizing the resources. It was actually alarming to note that such a small number of the nursing user category use CINAHL database which is generally meant for the nursing profession. This is critical as patient care is the main objective of these professionals, that is, doctors and nurses. The Internet is a valuable medium for information vis a vis current information “provided that its use is accompanied by training in the identification, use, and application of evidence in practice” (Cullen, 2002).

From the findings, this study therefore recommends:

- The need to provide continuous information literacy skills training that includes basic introduction to computer skills, search techniques, sources of information.
- Train users on the various search functions available so as to optimize on information retrieval from available databases.
- design portals of carefully selected resources for ease of access as well as to maximize on the utilization.

The amount of information in the World Wide Web can be a researcher’s nightmare. There is a choice of different search tools, search capabilities that the web offers. It is important for users to familiarize themselves with the “search tools and to develop search techniques.” By doing so they will avoid “spending many fruitless hours flailing about, and eventually drowning in a sea of irrelevant information” (Tyner, 2001).

## References

- Bellardo, HT, 1998. Text Retrieval Online: Historical perspective on web search engines. *Bulletin of the American Society for Information Science*.
- Bergman, MK, 2001. The Deep Web: Surfacing Hidden Value. *Journal of Electronic Publishing* 7(1) Available at <http://www.press.umich.edu/jep/07-01/bergman.html>
- Bless, C, & Higson-Smith, C. 2000. Fundamentals of social Research Methods: An African perspective. Zambia : Juta Education (Pty) Ltd.
- Boolean searching for the web. 2002. The Teaching Library, University of California. Available at <http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Boolean.pdf>
- Busha, CH, & Harter, SP. 1980. Research Methods in Librarianship: Techniques and Interpretation. Orlando : Academic Press, Inc.
- Carlson, CN, 2003. Information overload, retrieval strategies and Internet user empowerment. In Haddon, Leslie, Eds. *Proceedings The Good, the Bad and the Irrelevant*. 1(1):169-173  
Available at [http://eprints.rclis.org/archive/00002248/01/information\\_overload.pdf](http://eprints.rclis.org/archive/00002248/01/information_overload.pdf)
- Cullen, RJ. 2002. In search of evidence: family practitioner's use of the internet for clinical information. *Journal of Medical Library Association*, 94(4):370-379
- Chen, H, et al 1998. Internet Browsing and searching: User evaluations of category map and concept space technique.  
Also available at <http://ai.eller.arizona.edu/go/intranet/papers/Internet-98.pdf>
- Cheryl, D. 2005. Information-seeking behaviour of nursing students and clinical nurses: implications for health sciences librarians. *Journal of Medical Library Association* 93(2):213-222
- Cohen, LB. 2001. 10 tips for teaching how to search the web. *American Libraries* 32(10):44-46
- Dee, C. 2005. Information seeking behaviour of nursing students and clinical nurses: implications for health sciences librarians. *Journal of Medical Library Association* 93(2):213-222
- Dumais, ST. 1991. Improving the retrieval of information from external sources. *Behaviour Research Methods, Instruments & Computers*. 23(2):229-236

- Gaudinat, A. et al. 2006. Health search engine with e-document analysis for reliable search results. *International Journal of Medical Informatics* 75: 73-85
- Gladney, HM. 2005. Information Retrieval. *Digital Document Quarterly*, 4(1)  
Available at: [http://home.pacbell.net/hgladney/ddq\\_4\\_1.htm](http://home.pacbell.net/hgladney/ddq_4_1.htm)
- Harris, R. 2000. Internet search tips and strategies  
Available at <http://www.virtualsalt.com/howlook.htm>
- Hersh, WR et al. 2002. Factors Associated with success in searching MEDLINE and applying Evidence to answer clinical queries. *Journal of the American Medical Informatics Association* 9(3):283-293
- Jerome, WE et al. 2002. Obstacles to answering doctors' questions about patient care with evidence: quality study. *British Medical Journal* 324:1-7
- Kobayashi, M & Takeda, K. 2000. Information retrieval on the web. *ACM Computing Surveys* 32(2): 144-173  
Also available at <http://jewel.morgan.edu/~lisidore/Cosc357/Research/p144-kobayashi.pdf>
- Landoni, M & Bell, A. Information retrieval techniques for evaluating search engines: a critical overview  
Available at <http://www.cis.strath.ac.uk/~monica/WebSearchEval.rtf>
- Lee, SS, Theng YL and Goh, DH. 2005. Creative information seeking Part I : A conceptual framework. *ASLIB Proceedings*, 57(5):460-475
- Mettrop, W & Nieuwenhuysen, P. 1998. Some empirical research on the performance of Internet search engines.  
Available at <http://homepages.cwi.nl/~wouter/IRT/pub198-00/Colis1999/mettrop.pdf>
- Shaw, RL. Et al. 2004. Finding qualitative research: an evaluation of search strategies.  
Available at <http://www.biomedcentral.com/1471-2288/4/5>.
- Spink, A. & Saracevic, T. 1997. Interaction in information Retrieval: Selection and effectiveness of search terms. *Journal of the American Society for Information Science* 48(8):741-761
- Technikon SA. c2001. *Information Retrieval III: Study Guide 1 for IRE391BE*. Florida
- Tyner, P. 2001. Sink or Swim: Internet search tools & techniques. Okanagan University College library.  
Available at <http://www.sci.ouc.bc.ca/libr/connect96/search.htm>
- Young, JM & Ward, JE. 1999. General practitioners' use of evidence databases. *Medical Journal of Australia* 170(2):56-8