INFORMATION SEEKING PATTERN OF IT GRADUATES IN ENGINEERING INSTITUTES AND UNIVERSITIES IN DELHI: AN EVALUATIVE STUDY

ABSTRACT

Information plays a significant role in the cultural, political, social, scientific and technological developments of this knowledge-based society and it has become one of the essential components for every human activity and fundamental resource for the overall development of any country. The quality of life, the prospects for social change and economic development depend increasingly on information and its exploitation. Seeking and using information are the common and essential human behaviours. Most of the time, information seeking processes assume an interaction cycle consisting of query formulation, receipt and assessment of retrieved results, and then either bringing the process to an end or reformulating the query and repeating the process until a perfect result set is found.

Information seeking and using behaviours of people in various settings have always attracted the interest of researchers in the field of Library and Information Science dating back to the early decades of the twentieth century. Information behaviour studies articulating the importance of placing a specific user group at the center of research, and paying close attention to their internal motivations and needs, help the information professionals for providing better library and information services, designing new information systems and enhancing the existing systems for the particular community. A careful examination of the literature on the information seeking behaviour of academic community in India exposed that no comprehensive study focusing on the information seeking pattern of academic community specializing the field of Information Technology has been taken up by any researcher. Hence the present study was undertaken by the investigator.

The present study is a survey-based investigation of information seeking patterns of IT graduates in engineering institutes and universities in Delhi. By undertaking the present study, the researcher aim to gain an in-depth understanding of the information seeking patterns of IT graduates by exploring the information needs
Abstract

and information searching, gathering and use behaviour of the academic community in Delhi in the field of IT. Based on the analysis of data and findings and inferences drawn the study put forward some suggestion for the design of effective information systems and provision of efficient information services in IT.

STATEMENT OF THE PROBLEM

Different behavioural patterns through which people belonging to various disciplines interact with information are systematically studied by earlier researchers in the field of information science. The findings of these studies have constructive role in the design and implementation of specific information systems and services. In such a state of affairs, the investigator has selected the problem of the current research as “Information seeking pattern of IT graduates in engineering institutes and universities in Delhi: An evaluative study”. The present investigation is an attempt by the researcher to enable him to make recommendations for the design of information systems and services that could meet the specific information needs of people who are directly or indirectly associated with the Information Technology (IT) based studies and/or research. In view of this rationale, the researcher has under taken this study to gain a clearer view of the information-seeking behaviour pattern of IT graduates while undertaking their academic assignments. The information seeking patterns of IT graduates including postgraduate students, research scholars and faculty members have been studied.

OBJECTIVES OF THE STUDY

By undertaking the present study, the researcher aim to gain an in-depth understanding of the information seeking patterns of IT graduates by exploring the information needs and information searching, gathering and use behaviour of the academic community in Delhi in the field of IT. The following explicit objectives guided the study:

- To determine the needs, methods and mostly preferred types of information sources in the information seeking activities of the IT graduates including PG
students, research scholars and faculty members in engineering institutes and universities in Delhi.

- To assess the level of importance on libraries and information centers in the information seeking process of the IT graduates under study and to study their satisfaction level on various sources and services provided by the library for fulfilling their information requirements.

- To seek the opinion of the respondents regarding the necessity and importance of libraries in their physical form and printed information sources for meeting their information requirements in the era of ICT and digital technologies driven world.

- To find out the preference of the PG students, research scholars and faculty members in IT on the printed and electronic resources in their information seeking activities.

- To explore the respondents’ familiarity and usage of various electronic information resources and to identify their skill and ability in searching and locating right and useful information in the electronic environment.

- To examine the IT graduates’ familiarity and usage of the latest IT based library and information services during their information seeking activities.

- To inspect the role of social networking sites, news resources, conferences, seminars, etc. in the respondents’ information seeking procedures.

- To understand the differences in the information seeking patterns of IT graduates.

- To identify the problems and barriers faced by the IT graduates while seeking and gathering information and to suggest remedial measures for improving the quality of information services in the field of IT and enhanced access to qualitative information.

**HYPOTHESES**

Based on the findings of the earlier researches conducted on the information seeking pattern of people from different contexts, the following hypotheses were formulated by the investigator:
Abstract

Hypothesis 1

All the IT graduates in engineering institutes and universities in Delhi, irrespective of their different educational levels, give priority to the Internet over other information intermediaries including libraries to meet their information requirements.

Hypothesis 2

There exists no significant difference among PG students, research scholars and faculty members in the field of IT regarding their preference to electronic information resources over the printed resources.

Hypothesis 3

Innovative online information services are heavily used by the IT graduates irrespective of their different educational levels.

Hypothesis 4

There is no significant difference among the IT graduates in the use of various search techniques during their search for information in the electronic media.

Hypothesis 5

There exists no significant difference among PG students, research scholars and faculty members in the field of IT regarding their use of social networking sites for academic information seeking.

SIGNIFICANCE OF THE STUDY

One important among the different user communities on which information behaviour researches are carried out is the academic community including students, researchers and faculty members affiliated with colleges, institutes or universities. Academic populace including the students, researchers and faculty members are meticulous information users for various purposes related with their teaching, learning and research activities. They make use of a variety of information services provided
by the academic libraries and other information intermediaries. India is considered as one of the emerging superpowers of the world and one of the biggest factors that helped India to make its mark on the global economy is its booming Information Technology (IT) industrial sector. As the IT industry has also created significant demand in the Indian education sector, academic community in the field of IT must have been focused by the information behaviour researchers.

This study provides unique insights into the information seeking pattern of Indian IT based academic community from their own perspectives expressed in their own words. In light of limited access to international information sources and many difficult conditions faced by the academic community in developing countries, this study’s findings add to the body of knowledge in information science by documenting how the IT based academics in India experience various barriers, and how in spite of them, they accomplish their information needs. Library professionals dealing with the IT community in developing nations in general and in India in particular could use the study as an additional informative source for the design and implementation of their information policies.

RESEARCH METHODOLOGY

The present study has been carried out in three research phases. In the preliminary phase of the investigation, the researcher has tried to build a framework for the study. During this phase the researcher conducting thorough review of literature in the information seeking behaviour research, identified various areas of investigation and the research approach, developed the research design and research instruments and determined where, when and who for collecting appropriate data for the study and the tools and techniques for analyzing the collected data. In the secondary phase, the data regarding the information seeking patterns of the population under study was collected, coded and analyzed. In the third and final phase of the research, the investigator reported the findings and inferences drawn from the study, discussed them and also presented some suggestions and recommendations.
Abstract

Literature Review

Review of literature has a predominant role in the research process as the practice helps the researcher to recognize the stated as well as unstated assumptions underlied by previous researchers in the areas of the problem under study and also to become the researcher a master of the theories and principles applicable to the phenomenon of the study. In the very earlier stage of the research, the researcher undertook an extensive literature review on theoretical and empirical research findings of the information needs and information-seeking behaviour of different populations. With his experiential knowledge in the area of study, the researcher could locate and examine a number of appropriate literatures in the area of information seeking behaviour published in various scholarly information sources and partitioning the area into various subsections, the literature review was performed.

The review contributed to have a general understanding of the information needs and information seeking behaviour of people in different contexts and also helped to identify the research approach that could be used for this study. The extensive review of literature revealed that no study focusing the information seeking pattern of IT graduates in engineering institutes and universities in Delhi has been taken up by any previous researchers.

Population and Selection of Sample

The present study was taken up to study the information seeking pattern of IT graduates in engineering institutes and universities in Delhi. In Delhi, there are 12 universities and 32 engineering institutes, including both in the government and private sector. For the purpose of drawing sample, the purposive and census sampling techniques were used. As the present investigation attempts to study the behaviour IT graduates only, the researcher selected a sample of engineering institutes and universities which offer atleast a postgraduate course in any disciplines of Information Technology such as Information Technology, Computer Engineering, Computer Science, Computer Application and Telecommunication Technology. Consequently, nine universities and five engineering institutes in Delhi offering above mentioned PG
courses were considered. Out of these, five universities were using purposive sampling and five engineering institutes as census method for collecting data.

Selection of respondents was done by the Stratified Random Sampling technique. Respondents were divided into three strata as PG Students, Research Scholars and Faculty Members. The selection of respondents was also driven by some judgments based on research questions and conceptual frameworks and thus it was also decided to collect data from the academics only including the students, researchers and faculty members. Hence for the sample, the researcher selected only those subjects who, in his judgment, were likely to provide required information for the current study.

The subjects for the study were recruited using the incidental sampling technique. In the incidental sampling method, the primary concern is the convenience of the researcher in accessing the sample population. It was decided to carry out the collection of data among the students, researchers and faculty members incidentally without making any attempt to include participants possessing some visible characteristics.

Data Collection Methods

From a methodological point of view, assessing various tools used by those studies for collecting data and also considering various financial, geographical, temporal and methodological constraints, the questionnaire was deemed as the best fit research instrument for the present study to collect primary data from the population under study to gain a better and fuller understanding of their information needs and capturing their information seeking patterns.

Questionnaire Method

Questionnaire is one of the most popular and predominant research instruments in the survey based qualitative studies for obtaining data directly from the geographically scattered and diverse large population. For the present study, the investigator designed a questionnaire consisting of 36 questions, mainly closed end
Abstract

questions, to gather the necessary and accurate data regarding the information needs and seeking pattern of IT academics.

Questionnaire Design

After identifying questionnaire as the research instrument for the present study, concrete decision regarding the design of an effective questionnaire was taken as the questionnaire becomes effective only when it is designed with complimentary research questions. Based on the researcher’s research experiences in the field, prior assumptions and beliefs about information seeking behaviour of academic community in India and from the outputs gained from the extensive literature review carried out earlier, the investigator designed a questionnaire to collect data from the academic community including students, researchers and faculty members in the field of IT. The online version of the same questionnaire was also designed using the ‘Google Form’ keeping in mind the fact that in this day and age most of the people, especially those associated with the field of IT, prefer to fill the survey online.

Enough care was given to develop a questionnaire which contains very clear and easy to understand questions to accurately capture various information seeking patterns of the population under study. Ample attention was also paid to keep the questionnaire interactive such that its layout was pleasant to the eye and the order and sequence of the questions was easy to follow. The questionnaire consisted of mainly closed end questions expecting the respondents to select answer(s) from a list of possible options provided. In addition, an extra category for “Other” was also included in closed end questions to include for all possible results. Some open-ended questions were also included to give respondents their own answer and their opinions about their views to the question.

Pilot Study

A pilot study was conducted by the investigator to identify problems that the population under study might have to understand and interpret the questions and to test the validity of the questionnaire, which was used as the primary research instrument for the present study. The pilot study for the pre-test was conducted under
the actual field conditions on a small number people supposed for conducting the actual data collection. During this survey, which was conducted in the month of August, 2014, 50 questionnaires each were administered among PG students, research scholars and faculty members from Delhi Technological University and Indian Institute of Technology Delhi. The difficulties faced by the respondents while filling-up the questionnaire and their suggestions were noted down.

The pilot study was found to be very helpful as a number of suggestions were recorded by the respondents, especially research scholars and faculty members, and based on their feedback and the suggestions the investigator could enhance the quality of the questionnaire and make it more clear and structured. All the suggestions were critically analyzed and needful modification were made in the questionnaire wherever found necessary. Some questions which were felt irrelevant were removed and the sequence of questions was improved by inserting some questions at suitable places. After editing the questionnaires, the investigator observed that the modified questionnaire could now be used to draw out more consistent data to fulfill the objectives of the study.

**Administering the Questionnaire**

After modifying the research instrument conducting the pilot study, researcher thoroughly examined various methods of administering questionnaires in survey based studies in India. From the experiences gained by the researcher during the pilot study, the researcher felt that the personal approach would yield more data for the present study and thus it was decided to meet the respondents personally to get the questionnaires filled. For administering the questionnaires, the researcher personally visited all the 10 institutes selected for the study in different months of the years 2014 and 2015 during the academic session 2014-15.

As the incidental sampling technique was used for recruiting the subjects for the study, the researcher visited the respondents in various places in the institutes such as their offices, class rooms, practical laboratories, research laboratories, libraries, etc. with the permission of head of the institutes. The researcher first introduced himself
and about the study to the respondents and requested to fill the questionnaire. They were also assured that the information provided by them would be used for research work only and the confidentiality of the information provided by them would be kept. Many of the respondents were pleased to participate in the survey and accepted the questionnaire with the promise of returning the filled in questionnaire later, while some others were reluctant to involve themselves in the survey for some reasons and refused to accept the questionnaire outright. Some of the respondents were ready to participate in the survey but were hesitant to fill the printed questionnaire. The researcher collected the email address of such respondents and emailed them the online version of the questionnaire.

During the administration of the questionnaire, the researcher felt that 30 percentage of the sample population would be enough to ensure a sample which will represent the whole population of the academic community under study. Accordingly, a total number of 946 questionnaires were administered among the participants, which included 701 Postgraduate students, 136 Research scholars and 109 faculty members. Among the distributed questionnaires, 80 was administered online; 11 to Postgraduate students, 29 to Research scholars and 40 to faculty members.

Document Review

Apart from making use of questionnaire for collecting primary data, the investigator also checked with various printed as well as electronic resources such as annual reports, pamphlets, brochures, concerned websites and other records for collecting secondary data to obtain historical and other types of information required for the study.

ANALYSIS AND INTERPRETATION OF DATA

The data collected from the respondents through questionnaire was scrutinized by comparing answers to one question with answers to related questions so as to check consistency and compatibility. The filled-in questionnaires were made more or less uniform and responses were quoted and classification was done by reducing data into homogeneous groups for getting meaningful relationships. The researcher divided
data from the questionnaire into different theme categories in relation to the research questions. Using a self-designed coding sheet, statistical counting was done for each response. Finally the data were organized, analyzed, compared, consolidated, tabulated and interpreted by using statistical techniques, tables, percentages. The statistical techniques such as Chi-Square test, Weighted Arithmetic Mean (WAM) and Arithmetic Mode analysis were used to verify the validity of results. With the help of above mentioned statistical tools findings and conclusions were drawn and hypotheses were tested.

**BIBLIOGRAPHIC STANDARD FOLLOWED**

The investigator has followed the American Psychological Association (APA) style of citation and referencing (6th edition, 2009) for citing the bibliographic references in the thesis. For citing within the text as well as giving references at the end of each chapter, the prescribed standard of APA has been followed.

**MAJOR FINDINGS OF THE STUDY**

The following are the major findings of the present study conducted among the IT graduates from various engineering institutes and universities under study.

1. Major information needs of PG students are related with their general learning activities and updating knowledge base. Research scholars have information needs concerning their learning as well as research activities and faculty members mainly seek information for teaching as well as research needs. Information needs of IT graduates vary among different categories. The finding is in consistent with Kuruppu (1999) and Mavadza (2011).

2. There exists difference among the different categories of IT graduates under study regarding their preference level to various information intermediaries for meeting their information requirements. Internet is the most preferred information intermediary for researcher scholars and faculty members whereas university/institute library is highly preferred by PG students. It supports the findings of Catalano (2013) and Nwagwu (2012).
Books and reference sources are the information sources IT graduates under study highly depend upon for information. Theses/ Dissertation, Journals and Technical reports are also referred in greater manner by the respondents. Patents and Trade literature are the least used sources of information. The result is in line with Mishra (2011) and Sudha (2013).

Majority of the IT graduates (48.6%) are highly confident and a considerable number of them (36.8%) are moderately confident in their ability to locate right resources to meet their information needs. Only a few of them are less confident (9.7%) and a negligible number of them are not at all confident (2.2%). Comparing the three groups, faculty members are much more confident than research scholars and PG students whereas research scholars are confident than PG students to locate their required information.

Important factors considered by IT graduates for selecting information sources are cost of the resource (72.7%), immediate accessibility (66.9%), relevancy to the area of study/research (57.7%), date of publication (55.7%) and publisher’s reputation (42.5%).

All IT graduates prefer to use resources in English language (100%) for information gathering. Information sources in Hindi (13.6%) and other languages (1.9%) such as Tamil, Kannada, Gujarati, Manipuri and Telugu are also referred by a few of them.

Tendency of using latest and current information resources while seeking information is highly prevalent among all groups of IT graduates as 28.5% and 28.1% of the IT graduates under study always and most of the times, respectively, go for updated and current information resources. Only 13.1% rarely and 9.3% never mind the currency of information resources. This behavior is high among the faculty members and then among researcher scholars.

Majority of the IT graduates (43.3%) do not consult resources of more than 10 years old for seeking information. About one fourth (22.2%) of the
respondents consult only those resources which are published by not more than 5 years and 3.1% of them consult only latest resources.

9 The library usage for meeting information requirements is varying significantly among the IT graduates with different academic levels. It is high among the PG students, fair among the research scholars and comparatively meager among the faculty members. This finding is in consistent with Tucci (2011) and Singh & Kumar (2013).

10 The availability of required information through other media than libraries like internet and unavailability of required sources in libraries are the primary reasons why the information seeking through libraries is infrequent among the respondents who have a lesser habit of library use.

11 OPAC/Web OPAC (82.6%) and browsing resources at the shelves (54.5%) are the mostly preferred media to search and locate the needed information sources by the respondents. The help of reference librarian (46.2%) is also sought by a large number of the IT graduates to reach the materials they are in need of.

12 The feature with which most of the respondents are satisfied with libraries as far as their information seeking activities are concerned is libraries’ working hours. ICT infrastructure, Library services and Staff attitude have been ranked second to fourth respectively in this regard. At the same time, library collection is the least ranked one by all the respondents.

13 Almost three fourth of the population (74.1%) are of the view that although a plethora of information is available on the Internet on all subjects, printed materials and libraries are essential and they cannot be replaced by the Internet and the electronic resources.

14 IT graduates are extensive users of e-resources rather than print resources. Among the studied population, 30.3% of them very often, 30.0% of them always and 27.7% often found to be preferring e-resources over print
resources. Those who prefer e-resources over print resources rarely or never are very few in number. There exist differences among the respondents regarding their preference to electronic resources.

The distinguishing features of the e-resources such as allow distant access (73.2%), provide timely access (63.1%) and ease of use (53.9%) are the most important reasons why the majority of the IT graduates prefer them over print resources. E-resources’ distinctiveness to provide link to related information (45.6%) and support searching capabilities (32.6%) are also found to be liked by a good number of respondents. This confirms the findings of Ge (2010) and Shabani, Naderikharaji (2011).

Unfamiliarity and unawareness (21.9%) about e-resources is major reason why majority of the IT graduates under study could not make much use of e-resources. Another vital reason is the overloaded information (12.6%) in the electronic format. Lack of interest (6.3%), lack of proper internet access (6.2%) and unavailability (4.6%) are also reasons for infrequent use of e-resources for some of the respondents.

Regarding use of e-resources, PG students heavily depend on E-books whereas research scholars and faculty members depend on e-journals for getting information required by them. E-books are also important for research scholars and faculty, but for PG students, e-journals are not as important as for others. ETDs and E-Reference sources are also highly used resources by the respondents under study.

Open access e-resources are very much used by the IT graduates than the subscription based resources for their information seeking activities. 50.3% of the respondents use such resources only. At the same time, a substantial number of the respondents (38.1%) make use of both free e-resources as well as subscription based e-resources. The number of IT graduates who consult only subscription based resources for information is very small. This result supports the findings of Tahira, Alias & Ameen (2011).
Abstract

Most of the respondents (38.9%) access the subscription based information resources through the subscriptions made by their university/institute libraries. IT graduates who access information resources by both subscribing personally and through library subscription are relatively less (8.3%) and through only personal subscription is very low (2.4%).

Online databases, networks, etc. are extensively used by the IT graduates to access e-resources like e-books, e-journals, ETDs, etc. for meeting their information requirements. Faculty members are extensive users of such resources and research scholars are a bit lower comparing to faculty and usage frequency of such resources is comparatively low among the PG students. Taylor (2012) and Suarez (2013) also have a similar conclusion.

IEEE Xplore (82.5%) and ACM Digital Library (72.4%) are the heavily used online databases by the IT graduates. UGC-INFONET (59.2%), ScienceDirect (55.9%), and SpringerLink (53.4%) are also accessed by more than half of the population. INDEST (37.4%), Scopus (33.4%) and Web of Science (31.9%) are also used by a noteworthy number of them.

Most of the respondents (71.5%) are happy and content with the amount of qualitative databases, networks, etc. available in the field of IT. Nevertheless, 28.5% of them are found to be having a differing view and they feel an adequacy of qualitative databases, networks, etc. in the field for accessing qualitative information.

Various initiatives and services started to improve access to online resources are extensively used by the IT graduates. E-journal consortia is the leading one being used extensively by all the respondents. Institutional repositories are also widely used by researchers and faculty members and least used by PG students. While subject portals are ranked third by all respondents, e-learning portals, though widely used by students, are least used by other respondents.

IT graduates largely make use of the simple keyword based information searches in the networked environment. Advanced searches are carried out by
a small number of respondents and most of them depend on the *Boolean search* if they conduct advanced search. Other techniques are not much used by most of the respondents barring some faculty members. There exist significant differences among the IT graduates in the use various search techniques during their search for information in the electronic media. It demonstrates the findings of Anaraki & Babalhavaeji (2013).

The habit of ceasing the information search even if they fail to get the required information in their initial attempts is not evident among most of the IT graduates as majority of them (66.6%) continue their search by changing the search techniques, while some others (21.7%) do it by changing the search engine/databases.

A large number of the IT graduates are skilled (65.9%), more than quarter of them are moderately skilled (27.5%) and none of them is unskilled in seeking and gathering online information appropriately from the general web. They are also skilled in seeking and retrieving appropriate information from the online databases and networks, but their skill in this regard is less comparing their skill on the general web. Malliari, Korobili, Zapoundou (2011) also have a similar opinion.

Even though majority of the IT graduates are skilled in using e-resources, most of them (66.5%) feel the necessity of training and orientation programs for better use of e-resources.

Most of the IT graduates under study believe that news resources such as newspapers and news channels have a significant role in shaping their knowledge domain and a large majority of them (88.6%) make use of the news resources for their academic information seeking activities.

Among the total respondents, 31.8% see information made available through the news resources highly beneficial and 29.8% see them moderately beneficial. Respondents considering news resources less beneficial to their
academic works are 27.4% and those who believe news resources not beneficial is very small in number (3.2%).

30 Comparing news resources as a learning material from other academically important resources, more than one fourth of the IT graduates (28.7%) have an opinion that these resources are easy to learn from them and a noteworthy number of them (22.4%) see meeting information needs through news resources as difficult. However, majority of them (48.9%) are of the view that there is no much difference between news resources and other resources and are also like other sources.

31 Academic information seeking through social networking is prevailing in an extensive manner among the IT graduates as it is evident that 68.9% of them actively indulge in the academic social networking activities for gathering information. PG students, Research Scholars and Faculty members, irrespective of their different academic level, seriously seek information through social media.

32 Most of the PG students engage in academic social networking through the general social networking sites rather than academic SNSs. On the other hand researcher scholars and faculty members make much use of the SNSs which are dedicated to academic social networking.

33 Most of the IT graduates do not spend much time for academic social networking. 49.8% of them spend only less than 10 percentage of the total online information seeking activities on academic SNSs. Those who pay out 10-20 percentage of their online information seeking activities through social networking is 27.7% and those spending more than 20% of their online information seeking activities through academic SNSs are very few.

34 Majority of the IT graduates (34.8%) judge academic social networking as moderately beneficial and 25.2% of them found SNSs highly beneficial, while 23.0% of them consider them as beneficial but not as much as other sources. A
Abstract

very small population considers SNSs as not beneficial to their academic information seeking.

35 Almost every IT graduates support the argument that conferences, seminars, etc. are really good platforms for attaining information for keeping pace with the latest developments and emerging topics in the field of IT as 93.4% of them have this opinion.

36 Regarding the participation in conferences, seminars, etc. with the objective of getting latest and updated ideas and scholarly information, there exists significant difference among the IT graduates with different educational levels. Comparatively the habit is less among the PGs, high among researchers and very high among faculty members. This is in line with the findings of Marouf & Anwar (2010).

37 There exist a number of barriers that restrict the respondents from accessing the information required by them. The major barriers faced by the IT graduates under study while seeking information are unaffordable cost of resources, lack of information seeking skills, lack of time/hectic job schedule, and inadequate library facilities.

TENABILITY OF HYPOTHESES

In the light of the findings and inferences emerged from the study, the tenability of hypotheses was checked using Chi-Square test, Weighted Arithmetic Mean analysis and Arithmetic Mode analysis and is presented below:

Hypothesis 1: All the IT graduates in engineering institutes and universities in Delhi, irrespective of their different educational levels, give priority to the Internet over other information intermediaries including libraries to meet their information requirements.

The responses of the IT graduates under study regarding their priority level to various information intermediaries given in the Table 4.5 clearly indicates that the Internet is a highly preferred information intermediary for a large number of
respondents. But analyzing the responses given by the IT graduates on a five point Likert scale using the Weighted Arithmetic Mean (WAM) analysis, assigning weight to different priority levels giving greatest weight to the most favoured and the lowest weight to the least favoured, it is found that library is the first ranked information intermediary by PG students with a WAM of 4.20 while Internet has been ranked first by Research Scholars and Faculty members with WAM of 3.85 and 3.80 respectively, as given in Table 4.6.

Consequently it is concluded that even though Research Scholars and Faculty Members highly preferred the Internet as information intermediary, library is the highly preferred information intermediary for PG students and the Internet is the second ranked information intermediary for them. Hence, it can be concluded that, there exists small difference among the IT graduates understudy regarding their preference level to various information intermediaries for meeting their information requirements.

Hence the hypothesis is partially accepted.

**Hypothesis 2**: There exists no significant difference among the PG students, research scholars and faculty members in the field of IT regarding their preference to electronic resources over the printed resources.

It is found that from the Table 4.20 that IT graduates are extensive users of e-resources rather than print resources. It is found that among the studied population of IT graduates, 30.3% of them very often, 30.0% of them always and 27.7% often found to be preferring e-resources over print resources. But at the same time, from the table as well as the Fig. 4.6, it is very clear that there exist differences among the three categories of IT graduates under study in their preference to e-resources over print resources.

To prove this statistically, Chi-Square Test was applied on the responses and the analysis reveals that the observed Chi-Square value (36.67) was greater than the expected value (15.51) at 8 degree of freedom and 5% level of significance. Hence it
is concluded that there exist differences among the respondents regarding their preference to electronic resources.

Hence the null hypothesis is rejected.

**Hypothesis 3**: Innovative online information services are heavily used by the IT graduates irrespective of their different educational levels.

The responses of the IT graduates under study received on a five point Likert scale, regarding their usage frequency of various Innovative online information services such as E-journal consortia, Institutional repositories, Subject Portals and E-learning Portals given in the Table 4.30 clearly indicates that these services are heavily used by all the respondents.

A closer examination of the result obtained by the Weighted Arithmetic Mean analysis of the responses, as portrayed in the Table 4.31, illustrates that the Weighted Arithmetic Mean is above 4 in all the services by almost all categories of respondents and the difference between the weighted mean in all the cases is very low among all the respondents. Hence it can be said that, even though there exists a small variation in the usage frequency, all these services are frequently made use of the respondents.

Analyzing the responses of the IT graduates regarding their use of various online services using Arithmetic Mode, giving values 1 to 5 for negative to positive frequency levels i.e. Never to Daily, it is again found that the mode value for all the services is 4, as given in the table below. As “Frequently” was assigned the value 4, this implies that all the services are frequently used by IT graduates.

**Table 4.47: Arithmetic mode analysis of online services**

<table>
<thead>
<tr>
<th>Responses</th>
<th>E-journal consortia</th>
<th>Institutional Repositories</th>
<th>Subject Portals</th>
<th>E-learning Portals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>743</td>
<td>743</td>
<td>743</td>
<td>743</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mode value</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Hence the Hypothesis is accepted

**Hypothesis 4**: There is no significant difference among the IT graduates in the use of various search techniques during their search for information in the electronic media.

The frequency of use of different search techniques used by the IT graduates under study while searching for information from the networked media were studied on a five point scale. The responses of the IT graduates as given in the Table 4.32 clearly shows that while there is some similarities in the use of simple search, the case is different in the use of advances search features.

On analyzing the responses using the Weighted Arithmetic Mean analysis, it is found that, as given in the Table 4.33, the Weighted Means for Simple search, Boolean search and Federated search are almost identical among all the IT graduates. But, at the same time, Weighted Means of other advanced techniques are found to be differing significantly. Hence it is concluded that there exist significant differences among the IT graduates in the use various search techniques during their search for information in the electronic media.

Hence the hypothesis is rejected.

**Hypothesis 5**: There exists no significant difference among PG students, research scholars and faculty members in the field of IT regarding use of social networking sites for seeking academic information.

The investigation on the respondents’ information seeking through social networking, as exposed in Table 4.40, indicates that academic information seeking is prevailing in an extensive manner among the IT graduates as it is evident that 68.9% of them indulge in the academic social networking activities for gathering information.

On applying Chi-Square test to estimate the level of diversity among the respondents regarding the use of social media for seeking academic information, it is found that the Observed Chi-Square value (2.04) is less than the expected value (5.99) at 5% level of significance and 2 degree of freedom. Consequently, it can be
concluded that PG students, Research Scholars and Faculty members, irrespective of their different academic level, seriously seek information through social media and there exist no significant difference among them.

Hence the hypothesis is accepted.

SUGGESTIONS AND RECOMMENDATIONS

The analysis of the responses from the IT graduates in engineering colleges and universities in Delhi, the views, opinions and recommendations put forward by the respondents and the personal observations and interpretations of the investigator during the research works made him to propose some suggestions and recommendations in order to meet the information requirements of the IT people effectively and efficiently and to improve their information seeking experiences.

1 Libraries had been the central hub of information seeking activities of academic communities. But nowadays, there has been an increasing trend that people depend on the Internet rather than libraries for gathering information. Remorseless efforts must be taken by the academic library professionals to attract the information seekers towards the libraries and to make the non-users to active users by introducing more modern services.

2 Effective services such as Current Awareness Service (CAS), Selective Dissemination of Information (SDI), Indexing and Abstracting services, Translational services, Referral services, Inter Library Loan service, etc. may be provided to library users in addition to libraries routine services of circulation (issuing of books) and reference.

3 It has been emerged from the study that IT graduates are facing difficulties while seeking information due to low level of information literacy skills. Efforts must be made by the academic librarians to improve the information literacy skills of the users and thus their information seeking skills.

4 Academic libraries may provide their user community with extensive training programmes so often to be familiar with different types of information sources.
and services so that they can search required information, evaluate different sources of information, recognize and collect the right information and use it appropriately. Proper orientation program to introduce the subject specific-resources may also be conducted for the benefit of the users from different subject backgrounds.

The skills of information collection, classification, consolidation, repackaging and dissemination possessed by the LIS professionals must be completely utilized to provide the users with impeccable information services so that information seeking through libraries would be felt as entertaining rather than boring to the information seekers.

As it is evident that users are disparaging from the library, it is high time for libraries to reach to their users. Library may conduct periodical comprehensive user studies among the user communities so that the problems faced by them regarding their information requirements are understood and solved.

It has been found that the inadequate library collection is one of the major reasons why a large number of IT graduates restrain from going to libraries. As the libraries are the focal centre of the information seeking activities of academic community, academic libraries should always have an adequate collection of information resources. There should be an effective and functional collection building policy and update library collection regularly weeding out the outdated resources.

As the academic community in the field of engineering and technology in general and IT in particular prefer to use current and updated resources, LIS professionals at such institutes must keep this point in mind while developing their library collection.

All academic libraries may recruit well qualified full-time Reference Librarians to constantly monitor the information needs of the users and solve their problems in an efficient and professional way. This would also create a feeling among the users that the library staff is really concerned with their
problems. This will help to develop an interest among the users to come to the library frequently.

10 It has been found that, eventhough most of them opine that printed resources are still relevant, e-resources are very much preferred by the IT graduates than the printed resources. Hence libraries may add more and more qualitative e-resources such as e-books, e-journals, etc. to their collection.

11 Every academic library should open a separate E-Resources Access Centre staffed with qualified professionals with exposure modern technologies to make better use of the e-resources. The E-Resources Access Centre must have the best ICT infrastructure so as to facilitate electronic information seeking activities of their members. Facility of using and borrowing e-book readers may also be provided at the centre so that the users can have optimum pleasure of using digital resources.

12 It was found that scores of library users are unfamiliar and unaware of even about the subscribed e-resources and it is against the laws of library science. Care must be taken by the librarians to intimate all the users as and when new resources subscribed. They must also be given with proper training to make effective use of the e-resources.

13 It was also found that the habit of using advanced search facilities provided by databases are made use minimally. As the advanced search features help to retrieve more information, all the users must be thoroughly trained to take the advantage of such features.

14 All the e-resources subscribed by the library should be made available on the institution’s intranet so that users would have no restriction to access resources from anywhere in the institution.

15 Uninterrupted, high speed and 24 hours internet connection, both wired and wireless, should be available in all parts of the universities and institutes such
as library, computer centre, departments of studies, hostels, etc. to browse and download e-resources.

16 Librarians may take initiatives to setting up institutional repositories, digital archives, etc. to store and preserve the institutions’ intellectual outputs that can be made use of by other members of the institute also for meeting their information demands.

17 It was emerged from the study that most of the respondents go for free and open-source e-resources for meeting their information needs. But it is a fact that, even in a subject of study, there exist millions of free e-resources on the web. Librarians must take initiatives to develop high-quality subject gateways, subject portals, etc. in various subjects the institutes offer courses so that users of respective subject fields can easily navigate through qualitative resources and make use of them without wasting their precious time.

18 For enhancing the use of resources and library services, it is indispensable that, whenever a new service is started or new resources are subscribed, the same must be introduced and demonstrated among all the users. Demonstrations, user conventions, workshops, etc. by the service providers such as online database executives, consortia managers, etc. must be organized by the library.

19 As IT industry has an important role in the booming of the Indian economy, there is need for a national level library and information network exclusively for Information Technology. Initiative may taken by the DeitY, Govt. of India, to launch ‘IT-LIBNET’ through which modern and up-to-date IT information is made available to people who are related with IT as a subject or an activity directly or indirectly.

20 It is also suggested to develop a union catalogue of distributed IT resources among various technology institutes and universities in India. This will certainly help the IT scholars of the country to know about the resources needed to meet their information requirements.
Abstract

Social Networking Sites (SNSs) have become powerful tools for information seeking activities too. There are so many SNSs that are totally dedicated to academic information seeking and sharing and general SNSs are also used for academic information seeking. But, many of the users are not taking the advantage of such sites. Proper training must be given to the users for making the positive use of the SNSs for academic information seeking.

It was observed that many institutes block the social networking sites on their local area network. This practice may be helpful to put a ceiling on the use of such sites for unconstructive activities. But, at the same time, it is restricting many positive information seekers from getting useful information sought and shared. Hence, institutions must hold down from practice of blocking sites and should find other alternatives to restrict the off-putting use of such sites.

Every library may have an attractive and dynamic website which provides different information services provided the library. The library portal may host the web OPAC, announcement links to the latest additions and new services, links to e-resources, etc. It should also have RSS feed facility to inform the user of any updates on website.

In the field of IT advances takes place more often, conferences and seminars provide best opportunity to gather and share latest and updated information. Universities and institutions should encourage their students, researchers and faculty members to participate and present papers in important conferences and seminars at national as well as international levels. Financial assistants for registration, travel and other expenses for participating in atleast one national and international conferences and seminars atleast once in an academic year must be provided to IT graduates.

Similar to the projects such as NDL, TKDL, DLI, etc. the Govt. of India may also develop a National Digital Library in IT (NDLIT) through its National Mission on Education through Information and Communication Technology.
The digital library can operate virtual warehouse of learning resources in IT in various languages with a single-window search facility.

Unaffordable cost of resources is a main barrier that restricts access to the required information by the IT graduates. It is a fact that qualitative resources, printed as well as electronic, in the fields of science and technology resources are published from developed countries and are very costly to purchase by the users from developing countries like India. UGC and MHRD, taking view of this fact, may seriously think of increasing e-resources through e-journals consortia to universities and institutes.

It is observed that the information need and seeking patterns of users vary among different user groups depending on various factors such as areas of study, tasks, designations, etc. Library professionals of particular institute may try to explore the different information needs and patterns of its members conducting surveys, interviews, etc. and plan different information services for different variety of users.

Funding agencies such as UGC, ICSSR, DST, DBT, DSIR, DIT, etc. should sponsor more research projects on information seeking behavior of different kinds of people that would provide better inputs in the development of user-specific information systems.

DIRECTIONS FOR FURTHER RESEARCH

The present study brings into light the information seeking pattern of academics of IT field. The findings of the study direct to several topics on which further ISB research can be conducted. Based on the experiences of the present study, the investigator feels that a range of studies can be conducted in the area of ISB of academicians and are listed below.

1. A countrywide study on the information seeking patterns of IT academic community from higher education technology institutes of national importance such as IITs, IIITs, NITs, etc. can be conducted.
2. A comparative study of the information seeking behaviour of the IT academic community in the institutes of national importance IITs, IIITs, NITs, etc. and in the central universities of national repute can be undertaken.

3. A survey on the information seeking patterns of individual categories of academic community such as students, researchers and faculty members in the field of IT in various institutes and universities may also be undertaken.

4. Studies can also be conducted to investigate the information seeking behavior of academic community from other areas of engineering and technology subjects.

5. Study on the information seeking behavior of different types of population from various areas of studies with special reference to electronic information seeking patterns can be undertaken with a view to explore the impact of the digital technologies of the present time on the information seeking behaviours of users.

6. Studies leading to development of information seeking models suitable for Indian environments lack in the ISB researches in the country. Meticulous ISB research leading to development of information seeking models can be carried out by information professionals.

ORGANISATION OF THESIS

Chapter 1: Introduction

‘Introduction’ is aimed at providing a brief introduction to the subject of the whole study undertaken by the researcher. It begins with the background of the research giving basic concept of information seeking behaviour research. It includes statement of the problem, definition of terms, objectives, and hypotheses of the study. Further, the chapter also presents the research design briefing the population and sample, techniques used for collecting data, procedures employed for data analysis and interpretation, scope and limitations of the study and standards used for bibliographic references.
Chapter 2: Review of Related Literature

Chapter 2 presents the extensive review of literature in the information seeking behaviour research. A thorough literature review was taken up in earlier stage of the study critically analyzing a large number of investigations directly or indirectly related to the area of information seeking behaviour published in research journals of both national and international repute. Various aspects of information seeking in different contexts were reviewed and presented in the chapter under different sub areas.

Chapter 3: Information Seeking Behaviour and IT Graduates: A Theoretical Outline

This chapter provides a background about theory and research on information seeking behaviour. It presents a theoretical outline to information seeking behaviour in general as well as that of IT graduates and provides a background about theory, research on information seeking behaviour. It gives a description about various concepts related to information seeking behaviour of IT graduates too. It also explains some important models of information seeking behaviour developed by illustrious information seeking behaviour researchers and discusses the modeling of IT graduates information seeking pattern.

Chapter 4: Data Analysis and Interpretation

Chapter 4 deals with the analysis and interpretation of the data collected on the information seeking patterns of the population under study. The data collected from the respondents through questionnaires were tabulated, analyzed and interpreted using different statistical tools and the results have been presented in the chapter in tabular, pictorial and graphical forms. This chapter also presents the tenability of the formulated hypotheses based on the analysis.

Chapter 5: Findings, Suggestions and Conclusion
This chapter briefs the findings and suggestions of the present study. It explains various information seeking patterns of IT graduates in engineering institutes in Delhi. The future area of research has also been provided in the chapter.

The final part of the thesis contains Bibliography and Appendices. In the bibliography part, all the references and literature used for the present study have been included. The questionnaire administered to the population under study, both offline and online versions, and the list of engineering institutes and universities in Delhi have been provided in Appendices.