CHAPTER 5

FINDINGS, SUGGESTIONS AND CONCLUSION

This chapter highlights the major findings apprehended by the investigator on account of the evaluative study on the information seeking pattern of the IT graduates in engineering institutes and universities in Delhi.

5.1 MAJOR FINDINGS OF THE STUDY

The following are the major findings of the present study.

5.1.1 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).

5.1.2 There exists difference among the different categories of IT graduates understudy 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).

5.1.3 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).

5.1.4 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.

5.1.5 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%).

5.1.6 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.

5.1.7 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.

5.1.8 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.

5.1.9 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).
5.1.10 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.

5.1.11 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.

5.1.12 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.

5.1.13 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.

5.1.14 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.

5.1.15 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).

5.1.16 *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.

5.1.17 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.

5.1.18 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).

5.1.19 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%).

5.1.20 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.

5.1.21 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.

5.1.22 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.

5.1.23 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.

5.1.24 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).

5.1.25 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.

5.1.26 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.

5.1.27 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.

5.1.28 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.

5.1.29 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%).

5.1.30 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.
5.1.31 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.

5.1.32 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.

5.1.33 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.

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

5.1.35 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.

5.1.36 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).

5.1.37 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.

5.2 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.

5.2.1 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.

5.2.2 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.

5.2.3 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.

5.2.4 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.

5.2.5 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.

5.2.6 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.

5.2.7 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.

5.2.8 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.
5.2.9 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.

5.2.10 It has been found that, even though 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.

5.2.11 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.

5.2.12 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.

5.2.13 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.

5.2.14 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.
5.2.15 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.

5.2.16 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.

5.2.17 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.

5.2.18 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.

5.2.19 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.

5.2.20 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.

5.2.21 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.

5.2.22 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.

5.2.23 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.

5.2.24 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 at least once in an academic year must be provided to IT graduates.

5.2.25 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.

5.2.26 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.

5.2.27 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.

5.2.28 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.

5.3 CONCLUSION

Information Seeking Behaviour (ISB) studies have got such an immense potential that such studies are carried out from time to time on different types of users. The present study was carried out with an aim to have an in-depth understanding of the information seeking pattern of IT graduates in engineering institutes and universities in Delhi. Responses regarding various information seeking behaviours were collected from IT graduates including students, research scholars and faculty members. The study shows that IT graduates under study possess the habit of seriously seeking information for academic related teaching, learning and research
activities. Even though a large number of the respondents are being attracted towards the Internet for information seeking activities, majority of them are of the view that libraries and printed resources are still relevant even in this era of digital revolution.

IT is a field of study where advances in the field take place drastically and as a result the IT graduates have the habit of referring latest and updated information resources. IT graduates increasingly prefer electronic sources of information to printed sources and the major reasons for this is that e-resources provide timely access, support searching capabilities and allow distant and remote access. It is interesting to note that in this electronic era, there are some people even in the field of IT who prefer to use printed sources of information. Online databases, subject portals, e-journal consortia, etc. are also heavily used for the information seeking activities of the IT academics.

IT graduates are found to be skilled in using online resources. While a large majority of them are highly skilled in seeking and gathering useful information from the general web, their information seeking and gathering skill from the online databases is not at par with it. Despite the fact that IT graduates are increasingly depending on the electronic resources for meeting their information needs, there are considerable number of them who are not making much use of the qualitative resources subscribed by their institutes. Use of advanced searching techniques is also not as expected among the IT graduates. Unfamiliarity and unawareness is the main reason for the sporadic use of the e-resources by them and large majority of them warrant training and orientation for better use of such resources. It has to be taken care of the librarians seriously as considerable amount of money is spent for subscribing e-resources in libraries. However, it is interesting that the tendency of bringing to a close to the information search when the initial searches get failed to retrieve required information is less among the IT graduates. Instead, they found to be continuing their search changing search techniques or search engines.

It is noteworthy that news resources such as news programmes on TV, newspapers, etc. related to the IT field are also have an impact on the information seeking behavior of the IT community. A good number of them keenly make use of
such resources for grabbing information related to their areas of study and research. Another important information seeking medium for the IT graduates is the Social Networking Sites (SNSs). Both academic SNSs like ResearchGate, Academia, Quora, etc. and general SNSs like Facebook, Youtube, LinkedIn, etc. are made use of by the IT academic community for information gathering from friends and colleagues. They also try to take hold of the latest and updated information in their field by attending conferences, seminars, workshops, etc. too.

Hence to sum up, the analyses, evaluations and discussions above clearly make us to conclude that the information seeking pattern of the IT academic community is dependent on both traditional as well as digital sources of information. As they are already very familiar with modern technologies, they have more inclination towards the digital information seeking behaviours. It is high time that the library professionals to support their information seeking activities by providing state-of-art facilities in the libraries to meet their information needs. It is the duty of the library professionals to provide proper guidance and support to boost their information seeking activities. Efforts must be initiated to launch digital library projects like National Digital Library in IT (NDLIT), IT information system like IT-LIBNET, etc. to meet the information requirements of the IT community of the country.

5.4 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.