REVIEW

OF

LITERATURE
Chapter 2

Review of Literature

2.1 Introduction

Review of literature plays a very important role in research activities, as it provides the researcher an overview of what developments have been done in the area of research and helps to identify the gaps in the knowledge as well as the study. It also helps to detect connections and relations between different research results.

A good number of studies have been conducted which investigated the information need and information seeking pattern of library users based on their subject interest, information environment, and geographical location, as also research based on the library user’s studies across a variety of disciplines. Therefore, this review focuses on the students, faculty members, and research scholar’s information need and seeking patterns of information along with the review of some model forms which are the theoretical foundation of this study.

2.2 Information Need and Information Seeking Behaviour

In order to better understand how the engineering students, faculty members and research scholars are responding to changing information environment, adequate knowledge about the information requirements of the user community is the need of the hour. With improved understanding of the information requirements needs and information seeking behaviour of the engineers in academic environments, libraries can better develop their information resources and services, implement policies that help students, faculty members, and research scholars to access quality information, and improve collection development practices (Engel, Robbins and Kulp, 2011).

2.2.1 Information Need

According to Kuhlthau (1993) information need is often understood in information science as evolving from an unclear awareness of something missing and as culminating in locating information that contributes to understanding and meaning. Belkin and Oddy (1982) describes information need as an anomalous state of
knowledge (ASK) or a gap in an individual's knowledge in sense-making situations. Wilson (2000) points out that there must be an attendant motive when a person experiences information need.

Visvesvaraya (1975) studied the engineering information needs and services in the Indian context and proposed the setting up of an information system for national development. The study also indicated the need for engineering information under the framework of NISSAT.

Miller and Tegler (1986) discussed the information needs of the researchers and opined that online searching and its potential benefits to researchers and librarians must be relevant to the researchers, and to offer valuable services to an important constituency, they must fully understand the organic nature of research and the ways that scholars seek information.

Kawatra (1992) observed that the information needs depend upon the subject interest and type of activity of the researchers. In applied research, researchers are less literature oriented and have less value for recorded information. Therefore, the information needs are strictly relative to the subject interest, type of activity and level of the users, and the purpose for which the information is sought.

Davadason and Limgam (1997) in their study a methodology for identification of information needs of the users found that particular roles and their related task result in information need which is in turn affected by factors such as sources available, intended use of sources, individual characteristics of the user, and the environment surrounding the user.

Ongus and Nyamboga (2004) made a survey of the Egerton University, Kenya and discussed digital research libraries, the reasons, advantages, and disadvantages of digitisations, and opined that in order to cope with the needs of researchers in general, the research library should embrace the concept of digitising its materials for fast access and easy delivery of information.

Sharma and Prakash (2004) studied the information seeking patterns of scientists from the Defense Research and Development Establishment, Gwalior. The study reveals that researchers need correct and precise information for their day-to-
day work and the lack of user knowledge and reading materials are the main difficulties to use library services and accessing information. They considered the internet as the most popular media for communication.

Purnuma (2005) in her study information needs of college faculties revealed that majority of the college faculty members needed information for academic work, whereas university faculty members needed information to update their knowledge and as also for research work. A majority of the faculty members of various colleges and universities were unaware of the use of IT, because of lack of the infrastructure in the libraries.

Mahapatra (2006) found that the information needs and the habit of library use of scientists and technologists are related to their rank in the organisation. Online access services, offline digital sources, and internet services are the most popular library services in the upcoming electronic culture. With emerging needs and the increased fascination of scientific and engineering work groups for handling and use of the electronic information resources, information centers and libraries are expected to acclimatise with the inherent pressing needs of the changed mindset of the users.

Rubina (2009) conducted a study on information needs and information-seeking behaviour of faculty members at the Islamia University of Bahawalpur. The study discussed the kind of information that is needed for teaching and research, the sources that are used, the kinds of informal methods for acquiring information, the difficulties and issues involved in information seeking, the preferred study places of faculty members, and if the libraries’ physical setting facilitates active learning. The findings indicate that information could be motivated by several different needs.

Ajegbomogun and Okories (2010) studied users’ attitude on library overdue fines in Nigerian Academic Libraries. It is indicated that users kept overdue books simply because the information available in these books were specific to their needs and since such materials are expensive they could not afford to buy their own copies of the required textbook, even if available. The study suggests that the problems of budget inadequacies and shortage of materials in the library must be addressed in order to meet the information needs of the users. It also suggests to create an awareness on the need to return loaned materials as and when due.
2.2.2 Information Seeking Behaviour

Information seeking behaviour involves personal reasons for seeking information, the kinds of information which are being sought, and the ways and sources with which the needed information is being sought. Information seeking behaviour can also be described as an individual's way and manner of gathering and sourcing for information for personal use, knowledge updating and development. According to Wilson (2000) "the purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library), or with computer-based systems (such as World Wide Web)." Information behaviour can be defined as "the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking and use." A subset of this information seeking behaviour, which here is understood as the intentional seeking of information for a specific purpose or to fulfill a particular need. Kakat (2004) referred to it as the way people search for and utilize information. He observed that, often students' information seeking behaviour involves active or purposeful information as a result of the need to complete a course assignment, prepare for class discussions seminars, workshops, conferences, or write final year research papers. Undergraduate students may be smart people, but they still find the process of research challenging.

According to Leckie, Pettigrew and Sylvain (1996) information seeking behaviour is expressed in various forms, from reading printed material to research and experimentation. Scholars, students, and faculties actively seek current information from the various media available in libraries, e.g., encyclopedias, journals, and more currently, electronic media. Missingham (1999) stated that changing research environment due to the introduction of internet has brought several issues related to scientists, namely, adopting information pattern to the new media, ongoing browsing as opposed to new project searching, and the ability to find quality information. It is also stated that in this new world of bits and bytes, radical changes continue to occur in the communication of information, the behaviour required to discover information, and the value of services of information and libraries.

Fidel and Green's (2004) study emphasises that in order "to successfully
enhance engineers’ information-seeking, one needs to examine the specific factors that motivate an engineer to prefer one source over another.” According to Chihiro (2010) the initiation of information seeking behaviour was composed of the following three steps facing the occasion, setting the task, and selecting the information sources. These three steps were linked and organised by the activation of the searchers contexts. First, the activation of the searchers' contexts, which is triggered by facing an occasion, prompts the setting of the task. Second, the searchers' contexts are activated again, prompting the selection of information sources. Finally, the selection of the actual information sources enables the initiation of information seeking behaviour. When people initiate information seeking behaviour they must complete all three of these steps. In particular, the activation of the searchers' contexts is mandatory for progressing through the three steps.

Allen (1966) discovered that organizational scientists and engineers rely very heavily upon other scientists and engineers to fulfill their information needs, because they are better able to understand the user's requirements and can communicate their own ideas more effectively to the user. Technical colleagues, who are also members of the user's organization, are the most effective of all human information sources.

Palmer (1991) identified the personal factors affecting the information behavior of scientists and information. He stated that scientists are not "empty buckets," they are individuals who not only collect, store, retrieve, and use information, but also create it. The information produced by them is published in the form of conference proceedings, and journal articles and as reports. The Scientists and technologists mostly use the information systems at their disposal to carry out their investigations.

Ocholla (1996) study on information seeking behavior by academics found that a majority of the academicians depend on libraries and colleagues for information. Faculty members ranked the information sources in the following order of preference: journals, textbooks, research reports, and conference literature. On-campus colleagues were also considered as an important source of information.

Hertzum and Pejtersen (2000) investigated the information-seeking habits and practices of engineers and suggested that engineers value timely access to
information that did not waste their efforts. They wrote, "[w]e find that engineers search for documents to find people, search for people to get documents, and interact socially to get information without engaging in explicit searches." They confirmed the earlier research work about the information seeking behaviour of engineers. "Previous work has repeatedly found that engineers primary source of information is their colleagues within the organization and that the major reason for this is that colleagues are easily accessible."

Julien and Michels (2000) examined the information seeking behavior of individuals in the context of daily life. Ease and speed of use were considered as the most important criteria for selecting particular ideal sources. The investigators found that there was variation in information behavior by gender.

Kuffalikar and Mahakulkar (2003) analysed the information seeking behaviour of different categories of users were using Bio-chemistry and Microbiology department libraries of Nagpur University. There was a clear indication of invisible college, and user dependence was more on informal modes of communication, than the formal Internet surfing, attending conferences/workshops/seminars/refresher courses have widely helped the users in seeking current, updated information in their respective fields.

Kwasitsu (2003) examined the information sources used by the design, process and manufacturing engineers within one corporate environment. The researcher discovered that the higher the respondents' academic degree, the less likely they were to rely on colleagues or their own personal files for information and more likely to rely on the corporate library. He notes "many of the respondents had used libraries extensively for their degree work and were not only aware of library resources but had acquired a culture of finding and using reliable published information."

Kerins, Madden and Fulton (2004) in their study information seeking and students studying for professional careers the cases of engineering and law students in Ireland reported that majority of the students indicated that the internet was their first source of information while preparing for a project, and Mittermeyer (2003) in his study information literacy study of incoming first-year undergraduates in Quebec
also reported that many students used the internet extensively for finding course-related information.

According to Heinstro (2005), study on the influence of personality and study approach on student's information seeking behavior found that students want simple and common interfaces and they do not want to go to different databases with different search requirements and interfaces. They want easy methods and adopt it without considering its benefits and drawbacks. The student's choice is based on the least effort principle. In connection with this, it is often found that students use the cut and paste culture while preparing their assignments and projects. It is important to note that a massive variability exists among the students depending on their study behavior, and also probably their psychological profile.

Kingkaew and Neela (2005) conducted a study on information seeking behavior of faculty members of Rajabhat Universities in Bangkok. The study revealed that most of the respondents stated that faculty member, method of seeking information was to consult a knowledgeable person in the field. Libraries can influence students' information behavior by re-evaluating their instructional programs, and provision of resources and services. They can take a lead by working in collaboration with the academic staff to guide the students.

According to a study by George (2006), graduate students often begin with a meeting with the professors who provide direction, recommendations, and resources. Other students help to shape the graduate students' research activities, and the university library personnel provide guidance in finding the resources. The Internet plays a major role, although students continue to use the print resources. Convenience, lack of sophistication in finding and using resources and course requirements affect their information behavior.

Hemminger and Lu (2007) studied the information seeking behavior of academic scientists and noticed significant changes in information seeking behavior, including increased reliance on web based resources, fewer visits to the library, and almost entirely electronic communication of information.
Preeti (2009) conducted a study on information seeking behaviour of Punjab University. The study examined the kinds of academic information needed by the respondents, which resources they prefer, whether they are satisfied with the library collections, and the general pattern of information-seeking, with special reference to the influence of their course of study. The study revealed that information-seeking behaviour differs among various user groups. Academic libraries must understand the information needs of the faculty and students in order to address those needs.

Halder and Ray (2010) in their study on gender differences in information seeking behaviour in three universities in West Bengal noted significant differences in most of the domains of information seeking behaviour with respect to gender (male and female). Females scored high on all the domains of information search except in variety in search, where the males scored high. The findings may have implications for research and practice in psychology, especially in the sub-fields of educational institutions, library science, cognitive development, and training and performance appraisal.

From a study by Baro and Onyenania (2010) on information seeking behaviour of undergraduate students in the humanities in three universities in Nigeria, emerged that undergraduate students use sources such as textbooks, journals, internet, and also rely heavily on human resources for information. The study also revealed that undergraduate students use search strategies such as starting, chaining, browsing, differentiating, monitoring, and extracting. There is a significant difference between male and female students in the sources they use for obtaining information.

According to a study by Kannapanavar and Manjunatha (2010), library use pattern by faculty members of engineering colleges in Karnataka found that 53.2% of the users were using online public access catalogue (OPAC) to locate their reading materials, and 48.8% of the users were consulting the librarian and library staff for locating the documents in the library.

Onuoha and Awoniyi (2011) studied the students’ information seeking behaviour of two universities and found that students sought information mainly for the purpose of updating their knowledge, preparing for examination, and for doing assignments from textbooks and electronic sources. It was observed that students
prefer discussing with friends or persons they consider more knowledgeable. Students from both the universities hardly consulted the library catalogue, which is an indication that either the catalogue is not functioning well or that the students lack the necessary skills to enable them to make proper use of the library catalogue. The study recommends that both the universities should make more effort to stock the library with current and relevant information materials in all the academic programmes offered by the university in order to meet the students' need. Both university libraries should impart library accessing skills to the students to ensure that they have the required knowledge to enable them to make maximum use of the library resources. The study also recommends to carry out libraries survey to ensure its effectiveness.

Ravi (2011) conducted a study on information seeking behavior by the faculty members of post-graduate departments. He states that the first three preferences given by the faculty for seeking information are books, periodicals, and newspapers. Faculty members seek information for preparing lectures, keeping up-to-date knowledge, and research work. The principal task of information professionals is to satisfy the various information needs of users in different contexts, studying their requirements, their seeking habits, and their management and use of information.

2.3 Need and Purpose of Library Use

There may be several purposes, either academic, research or to update knowledge, for a user to use the library and seek information. Information source preferences of users have been affected by the information seeking behaviour, by the development of computers and telecommunications technologies, the information explosion, and the availability of a whole range of modern information technologies for the efficient use of information resources. The reasons for a user to select a specific information source has become of great importance because of the developments in the field of science and technology in the past decades. Following are the studies which deal with the purpose of using a library for seeking information.

The study of Pelzer, Wiese and Leysen (1998) marked that the students used the library mostly for photocopying, office supplies, and studying coursework while they preferred textbooks and handouts for current information. However, a major shift was seen from the use of print indexes and abstracts towards the use of computerised
indexes and other electronic resources. 60 percent of the students reported using the internet for current information. The overall use of electronic materials was highest among students receiving the problem-based learning method of instruction. Most of the students indicated that electronic resources would be important for future education needs, particularly the wealth of information and services available on the Internet and the World Wide Web.

Simmonds and Andaleeb (2001) conducted a survey on usage of academic libraries. They discussed the role of academic libraries in today's competitive pressures from different information providers and new technologies. The findings show that the use of academic libraries is influenced mostly by the users' perceived familiarity with the library and its resources. Those who are more familiar with the library are more likely to use the academic libraries. Females use the library more than males.

Lohar and Kumbar (2002) conducted a study on use of library facilities and information resources in Sahyadri Colleges, Shimoga. The study revealed in their study that respondents used the library for consulting textbooks, reference books, to acquire current and general information, and to read newspapers and popular magazines. The study brought to the light that all respondents were aware of the readings materials, library catalogue, and classification. The journal collection and physical facilities were found to be inadequate due to lack of finance. The authors suggested for the provision of sufficient funds by the authorities and also recommend having compulsory user awareness/orientation programme through audio-visual materials or through lecture method from time to time. They concluded that the chief intention behind the use of the libraries has been the academic interest of the users.

Hiller (2003) investigated the similarities and differences between scientist and engineers, and other academic areas in the library use and information needs at the University of Washington. He concluded that the decrease in physical visits to the library was most pronounced among faculty and graduate students in health sciences, sciences, and engineering. He further asserts that the faculty in the sciences and engineering were more likely to use the library resources remotely and viewed desktop delivery as the highest priority for library support.
Lohar and Kumbar (2007) evaluated the teacher's attitude towards library facilities and information resources in First Grade Colleges in Shimoga district. The study revealed that 52.25% of the users spent less than an hour and more than half an hour only in the library every week. Only a small fraction of the users were familiar with the inter-library-loan service.

Parvathamma and Anandhalli (2010) conducted a study on use of reading materials in engineering college libraries in Karnataka State. The study found that majority of the students and teachers visit the library once in a week and on average, they spend less than two hours during each visit. The purpose of the visit to the library is mainly to borrow textbooks. Students and teachers vary in their approach to locate the reading materials in the library. Students directly go to the shelves and search for reading materials, while teachers consult the OPAC to locate the required reading materials. Students are found to use informal channels like discussion with friends and teachers, while teachers depend more on books and journals to satisfy their information needs. Textbooks and Indian journals are the most frequently used documents in the library. While B E students use reading materials mainly to prepare for examination and seminars, teachers use the reading materials in the library mainly for teaching, preparation of research articles, and research project reports.

Rahiman and Tamizhchelvan (2011) in their study on information seeking behavior of students of engineering colleges in and around Coimbatore, found that the library remains predominantly the primary source among the students, as it continuously depended upon by the young engineering students. The other interesting finding is that the information seeking process of students is dominated by their visiting behaviour to the library. Students who visit daily mostly access newspapers, whereas students who visit monthly indicate that their primary purpose is to borrow books. The study also shows that libraries and managements should focus on adding more projects and theses, online resources and CD/DVDs, since a sizeable number of students feel that these resources are barely sufficient or insufficient. The librarians and managements should focus on providing more number of online resources, patents and standards, and CD/DVDs.

Mahapatra, Swain and Jena (2011) conducted a study on information needs of scientists and engineers in electronic environment. The study found that majority
of the faculty members favoured the lending services followed by the photocopy services, and internet browsing. The analysis of the study further shows that most of the respondents use the library daily followed by once a week. It is understood that key work access is the most preferred method of information access among faculty members of the engineering colleges of Bhubaneswar. Personally visiting the library was the most preferred method of seeking information among the faculty members. Though majority of the respondents opine that lack of time is the major hurdle to seeking information, the authors feel that this barrier can be most effectively overcome through information literacy programmes.

2.4 Usage Pattern of Information Resources

Information resources are one of the most important ingredients of any academic and research study. Based on the nature and type of resources, there are mainly two types of resources. They are print and electronic resources. Today users have access to vast amounts of information through a variety of sources in a variety of formats. While seeking information, users may prefer either print or electronic resources or both, for their information need. Most of the respondent engineering college libraries have both, printed as well as electronic information resources, in their collection. Electronic information resources especially journal literature are an important component of the science and technological institutions because they provide with the latest development in the field of subject.

Guruprasad and Nikam (2010) report the results of their study covering 16 aerospace organisations of Bangalore, India. Their analysis revealed that reading e-journals saved time and helped the scientists and engineers to gain more scientific knowledge. An electronic resource is defined as a resource which requires computer access or any electronic product that delivers a collection of data, be it text referring to full text databases, electronic journals, image collections, other multimedia products and numerical, graphical or time-based, as a commercially available title that has been published with an aim to market (Singh and Arora, 2010). Electronic Resources are becoming very important these days as they are more up-to-date, and can be accessed anywhere anytime, crossing all geographical boundaries. Following are few studies which reveal the type of information resources used by students, faculty members, and research scholars in engineering and other disciplines and their
preferred format (print or electronic) of information resources. Woo (2005) observed that while respondents prefer to use online journals compared to print journals, they still preferred print books than e-books. McCann (2010) stated that in 2004, the National Association of College Stores released the results of a survey of over 4,000 students from twenty-one campuses. According this study, 71 percent preferred buying traditional textbooks, and only 11 percent preferred the electronic versions. Some of the limitations of electronic texts reported were the following: cannot be given to friends, cannot be sold to used-textbook dealers or kept for permanent libraries and limitations on where and the number of times they can be viewed.

Fidzani (1998) conducted a study to determine the information-seeking behaviour and use of information resources by 223 graduate students at the University of Botswana. The general purpose of the study was to identify their information requirements and determine their awareness of the library services available to them. He found that journals, library books, and textbooks are the most popular sources of information for course work and research, and that students need to be taught how to use the available library resources and services. Students relied on library books (60 percent), followed by textbooks (52 percent), and then journals (43 percent) for their course work. Based on these findings, the study recommended that a questionnaire, on the students’ ability to use the information resources, be prepared and administered during registration to all masters’ students, to establish their ability to use the information resources. It also recommended that a more extensive information marketing strategy should be developed at both, the subject librarian and the departmental level to create awareness among graduate students.

A study conducted by Majid and Tan (2002) investigated the information needs and information seeking behaviour of computer engineering undergraduate students at the Nanyang Technological University, Singapore. They investigated the types of information sources used by the students, their preferred information formats, the importance of and reasons for using certain information sources, and the use of various electronic information sources. It was found that printed materials were the most preferred format among the students. A total of 96 (94.1 percent) of the respondents considered books as the most important information format used, and 86 percent of the respondents considered the electronic information sources as an
important information format. On the other hand, the use of databases and electronic journals was quite low among the computer engineering students. The study ended by recommending a promotional campaign for introducing electronic information sources to the library users.

Cheryl (2005) study on nurses' information needs found that human and print resources were preferred over electronic resources, reportedly because of convenience, reliability, and ease of use. Insufficient skills, training, and time were top barriers to the use of electronic resources. Lack of knowledge about the library resources and librarians' services contributed to low library usage. The paper of Kacherki and Thombare (2010) on print vs e-journal and information seeking patterns of users discusses the advantages and disadvantages of e-journals, and suggests that printed and e-journals are complimentary to each other.

Perpetua (2005) conducted a study that sets out to investigate the use of electronic resources by the students and faculty of Ashesi University, Ghana, in order to determine the level of use, the type of information accessed, and the effectiveness of the library's communication tools for information research. The study found a high level of general computer usage for information access, and a high usage of some internet resources, compared to a low use of scholarly databases. The low percentage was attributed to inadequate information about the existence of these library resources. The study recommends the introduction of information competency within the curriculum and/or the introduction of computer courses to be taught at all levels and the provision of more PCs on campus.

Doraswamy (2005) conducted a survey on familiarity and use of the available electronic information resources by the students in U R Siddhartha Engineering College Library, Vijaya Wada. The study revealed that 61.25% students are familiar with the electronic information resources, 27.5% of the students use the computer daily, and 5.63% have never used it. A small 2.5% of the students used CD-ROM, 33.13% - internet, 38.13% - e-mail, 36.87% - search engines, and 21.25% use website daily. The online databases were used by 25% and the catalogue' once a month. In rare cases, 18.75% of the students use online journals. The electronic information resource is used by 42.5% of the students for communication purposes. The main
problems faced while using the electronic information resources was lack of training and time

Kaur and Verma (2006) conducted a study on use of electronic resources at TIET library, Patiala. The study found from the data that all users are using the library but the purpose of using the library varies from person to person. A majority (72.7%) of the users visit the library for issue/return of books, 51.5% users visit the library for consulting periodicals/journals, and 40.9% for photocopying work. It has been found that printed materials are still the most popular medium and audio/video tapes are least used. It has been found from the data that maximum numbers of users were unaware of the various electronic resources. The study recommends awareness programmes for the users to educate them about e-resources. To save the users time libraries may start bulletin board services to inform the users about the new/current arrival of online journals/books/other material. For improving the services, the library has to take interest in adding to e-resources and providing computers with internet facility within the library. The library should conduct feedback/users survey to know the need of users from time to time.

Amarnath (2006) studied the pattern of usage of information resources by the research scholars in the Punjab Agriculture University Library, Ludhiana which found that a majority of the respondents visit the library with the purpose of consulting theses/dissertation, access to online databases, use CD-ROM databases, borrow/return of books, consult reference tools, to browse the internet, and consult periodicals. It is observed that journals in print form as well as e-journals, online databases, newspapers, e-books, audio/video materials, and reference tools are not strong enough to support the users' research needs. The results revealed that most of the researchers do not use periodicals in a non-conventional form. It is suggested that the library should develop a need-based collection, along with providing a proper orientation/education to the researchers so that the use of the non-conventional forms can be optimised and they remain fully aware of the latest know how of the tools and techniques of the library. The result of the study also revealed that most of the researchers of the university library were not aware of the Current Awareness Service (CAS) and inter-library-loan service. It is therefore suggested that CAS should be initiated by the university library though library bulletins, announcement of research.
in progress, and clipping service. User studies may be carried out from time to time with a view to determine the need of the research scholars and provide better services to them.

**Hussain and Kumar (2006)** carried out a survey on the use, collection, and services of the IIRS library. The study reported that, majority of the users of the IIRS library use the library services daily. They mainly used the library to borrow books and other materials and very few respondents use the library for audio-visual materials. Most of the respondents preferred the print collection (87.50% were using books), followed by the electronic collection (68.75% were using CD-ROM) followed by 86.25% respondents using the current periodicals.

**Raza and Upadhyay (2006)** carried out a survey to examine the usage of e-journals by the researchers in Aligarh Muslim University. The survey revealed that all researchers were aware of e-journals in the university. Many research scholars were consulting e-journals from their departmental labs and computer centres, not only for research purpose but also to update their own knowledge. Some problems like lack of training and slow downloading had been found, and the researchers felt the need for print as well as electronic journals.

**Kaur and Verma (2008)** conducted a survey on students and faculty members with regard to their awareness about electronic journals and their usage in Punjab Engineering College, Chandigarh, using the questionnaire method. Majority of the users were not aware of the library’s e-resources (69.15%) and INDEST the Consortium (77.63%).

**Mallaiah and Gowda (2009)** in their study on the collection development in Mangalore university library found that majority of the research scholars visit the library daily to meet their information needs. Further a good number of research scholars and teachers visit the library to borrow books and to consult periodicals. Thus, books and periodicals are the most heavily used items of resources in the total library collection. The overall opinion expressed by research scholars and teachers is that, among the information resources, periodicals - primary and secondary, report literature, and conference proceedings are not adequate enough to meet the needs of
the users. Therefore, it is suggested to provide adequate quantity of information resources and promote the use of information resources.

Kaur and Verma (2009) in their study on the use of electronic information resources, study found that faculty and research scholars were more aware of their library e-resources and services as compared to undergraduates. In response to the question whether they have heard the name UGC-infonet consortium, it was found that only 23.71% respondents knew about UGC-infonet. Faculty and postgraduates were more aware of it as compared to the other. Among the users who are aware of UGC-Infonet consortium, only 55.65% were using these e-resources. The maximum users, 53.98%, were using e-journals occasionally. The library should involve university academic departments in the selections of e-resources so that the required journals can be identified. Most of the users use hostel and computer centre as place for accessing electronic information than library and departments. The e-journals were used by faculty and research scholars more in the departments. The library should provide orientation workshop and ongoing seminars for students to guide them how to use electronic resources in order to extract maximum value from these resources.

Kumar and Kumar (2010) conducted a survey on perception and usage of e-resources and the internet by Indian academics. The study found that the students and faculty who participated in this survey were aware of e-sources and also the Internet. Even though a majority of the academic community use the electronic information sources for their academic-related work, most of them prefer the print to electronic information sources. Many of the students and faculty learned about the electronic information sources either by trial and error or through the advice of friends. Practical implications – Librarians need to reallocate more budget to expand the availability of electronic resources for students and faculty. Library professionals should also help the users to ascertain what high-quality free resources are available on the internet and how to search these resources more effectively and efficiently.

Radhakrishnan and Ashok (2010) in their study on research scholars' opinion on e-resources in University of Madras, took into consideration the research scholars' opinion on e-resources. The study found that most of the researchers felt that the electronic collections will elevate the level of the usage on certain aspects.
collections provide a better opportunity to archiving and information retrieval systems over a longer period of time.

The results of a study by Negahban (2010) on the faculties of Iran showed that Iranian faculty members were more dependent on all e-resources except for the e-books selected for the study. It was also observed that faculty members were more dependent on e-journals, followed by online databases, e-tutorials, and least on e-reports. Electronic information is becoming prevalent worldwide, and its use is growing exponentially as more and more users are recognising the potential that it offers in terms of access and delivery. However, with the introduction of new tools for e-information searching and retrieval, users have to readjust their information-seeking behaviour to cope with the corresponding changes.

The paper of Towolawi (2010) on acquisition and use of library resources in a University of Technology recommends that the library should acquire books and journals in appreciable quantity and quality with the creation of the Engineering and Environmental Sciences colleges/ besides the need for an improved and comprehensive user education programme for senior as well as new students along with members of the staff. Priority should also be given to the purchase of journals (local and international) and the users must be promptly informed of the arrival of these journals.

Kumar et al (2010) in a study examines the use of the collections and service at IIT, Delhi library. The study revealed that majority of the users' visit the library almost daily and the purpose of visit ranges from professional, preparation of competitive examination, and academic. A small percentage of users were not satisfied with the library hours and demanded that the library should be kept open for 18 hours throughout the year. The users were satisfied with the infrastructural facilities such as furniture, lighting, and ventilation whereas small percentages were not satisfied with the drinking water, cleanliness and toilet facility. The study depicts that a majority of the users were accessing online database services in the library independently whereas other users accessed through staff and friends. It is also observed that database search techniques were used by very few respondents. A small percentage of users were using the library networks for the exchange of information resources such as DELNET, INFLIBNET, NICNET, etc. Most of the users used the...
e-mail services for exchange of information. Suggestions have been given to make the collections and services more beneficial for the academic community of the mentioned technical institutes in India and abroad.

Ah et al (2010) in her study on the information literacy skills of engineering students identified the type and format used most frequently by the students for their course assignments. These include identifying the most efficient search strategy, evaluating Internet information and websites, as well as using the information ethically. The results of the study show that the respondents seriously lacked the necessary knowledge and skills to evaluate Internet information, to identify the most efficient search strategy, to use scholarly resources, and to use the information ethically. It is suggested to introduce intervention program to improve the students' information literacy skills.

Mukerjee and Kumar (2010) conducted a survey on the research scholars of the Banaras Hindu University to know the use of online journals available through the UGC-Infonet e-journals consortium. The findings of the survey revealed that 21.84% of the research scholars use the library website as the channel to access e-journals. The study concluded that comprehensive training on the availability and usability would be of great help to the users to make better use of the consortium.

In a study by Smyth (2011) on students' information use in the Social Sciences and Humanities it was revealed that there is a decline in the use of journals by the students as an information resource because they use the websites as alternative information sources. It says that students can also recover older materials with the online access.

Balu et al (2011) conducted a survey of the undergraduate students, postgraduate students, research scholars, and faculty members. The study revealed that the majority of the engineering college libraries (51.7%) do not fulfill the AICTE norms with regard to books and other type of reading materials. More than one-tenth of the users (10.1%) replied that their libraries do not have the latest editions of the books, and multiple copies of the prescribed textbooks (11.8%). Hence the authorities concerned should provide the engineering college libraries with the prescribed number of titles (latest editions) along with sufficient number of multiple copies as
At least three studies have found that college students prefer reading printed text over reading online. In 2004, the National Association of College Stores released the results of a survey of over 4,000 students of twenty-one campuses. In this study, 71 percent preferred buying traditional textbooks, and only 11 percent preferred the electronic versions. Some of the limitations of electronic texts reported were as follows: cannot be given to friends, cannot be sold to used-textbook dealers or kept for permanent libraries and limitations on where and the number of times they can be viewed (McCann, 2010). Although online texts cost one-half the cost of the printed versions, students had to give up a lot of freedom.

The landscape of the present media is quite complex and changing at a rapid pace. The electronic media has a wide spread in our daily lives and people quickly migrate towards it. The new generation has embraced this new media very quickly, and it is popularly called the net generation. In a study by Loan (2011), the results revealed that there is a strong competition between the print and electronic media in attracting students’ time and attention. Comparing the students’ preferences between reading and electronic media activities, reading proved to be one of the top most activities only defeated by watching television and listening to music. The results also depict that the electronic media is competing with traditional media on different fronts as activities like Internet surfing, online chatting, and electronic games are also preferred by a good number of the net generation students over reading.

Bhatt and Singh (2011) in their study on the e-information usage among the engineering academics in India with special reference to Rajasthan State revealed that the academic staff were using many types of e-resources like CD-ROM databases, WWW, e-journals, e-books, consortia services, e-theses, and digital archives. The print material was also popular, about 20 to 30 percent users were using such type of material. Using e-resources, their academic/professional competency also improved. The teaching methodology also involved e-resources uses and the students’ ability was also affected in a positive manner by this methodology. Time saving, more informative, more useful, easy to use, etc. were found to be the most important features of the e-resources. More than 60 percent of the users were not aware of the statutory provision to provide e-resources by their respective institutions. Some...
problems in using the e-resources were also encountered like technical or hardware/software problems, low speed connectivity, high cost, doubts in permanence of e-journals and e-books archive, etc. Majority of the users were quite satisfied with using the e-resources.

Sharma and Singh (2012) conducted a study on electronic access in Swami Devi Dayal Institute of Engineering and Technology. The study found that most of the faculty members and students prefer to use e-mail and e-journals. IEEE, Science Direct, and Springer Link are the most preferred databases by the respondents and more than 65% download full text journals. The study reveals that now is the time to accept the importance of e-resources for higher education system.

2.5 Usage Pattern of Facilities and Services

Mukherjee (1965) identified the library facilities in college libraries in India. The study revealed that majority of libraries did not have sufficient space for proper functioning. Some of teacher training colleges did not have their own libraries. The staff and students depended on the university libraries to which the education section was attached. All libraries were lacking inter-library loan services.

Oyeleltan (1992) conducted a study on undergraduates’ utilization of services in Nigerian University Libraries to survey the available audiovisual facilities and the extent of use. The study brought to light that all the respondents were aware of the existence of the audiovisual facilities in the media division. About 69.03% users were not satisfied with the loan policy.

Dadzie (2005) investigated the use of electronic resources by the students and faculty of Ashesi University, Ghana. He also made an attempt to know the extent of use, type of information accessed, and the effectiveness of the library’s communication tools for information research. The findings showed that the general computer access was high as also the usage for information access because of the university’s state-of-the-art infrastructure. The usage of some internet resources was also very high, while the usage of scholarly databases was quite low. The low patronage was attributed to inadequate information about the existence of electronic library resources.
Naushad (2005) examines the use of electronic information services among the users of the Indian Institute of Technology (IIT) Library in Delhi, India. The study found that lack of printing facilities, terminals, and trained staff were the major reasons that discourage users from accessing the electronic information service. The survey also revealed that some 60 percent of the users face difficulties while browsing e-information.

Chavez et al (2005) conducted library user survey on resources, facilities and circulation service. He reports that generally users were satisfied with the resources, facilities, and circulation service. It was recommended to repeat the survey in two years to compare the satisfaction level of the students.

Jeevan (2007) pointed out in his study technology-enhanced services and the librarian's identity crisis in academic and research libraries of India that, different library services which are provided by technology like web based, Internet based, CD-ROM based, Network based, and Consortium based Information services, and these are purely based on the digital documents or information resources like databases, e-books, e-journals, etc. The access to these services is offered by using the technology which in turn assists in providing precise services to the users. Digital libraries and virtual libraries are examples of the usage of modern technology.

Shinde and Ingale (2007) evaluated the students opinion on the library services in University Library Mahatama Phule Krishi Vidyapeeth, Rahuri, Maharashtra. They found that overall students were satisfied with the new services with suggestions to increase the PC's, subscribe to more journals, expand computer based facilities, and to improve the physical facilities of the library. The results itself justifies the need for more grants for a sustainable development of the library.

Rai (2007) conducted a descriptive study on effective utilization of hybrid library (digital and print media) in engineering colleges in Bangalore. The study found that the collection and service infrastructure in the sample regions were not up to the mark. The study recommends that all engineering college libraries should concentrate on procuring online databases through a consortium and save the precious time of the users. Engineering college libraries should stress on need-based value added services through automation of the library and implementation of the
information technology in order to provide access to a wide range of network based information resources and services to the users

Rama and Thandavamoorthy (2008) conducted a case study on enhancing service quality of libraries in technical institutions of selected libraries in Bangalore. The study proved that most of the academic libraries are concerned about fulfilling the physical infrastructure norms and standards laid down by AICTE and other regulating agencies like the state government and affiliating university rather than providing quality services, setting standards for services delivery and striving to enhance the quality of the service. It is high time that the libraries in all colleges realised that quality is the survival tool in this era of competition.

Biradar, Kumar and Mahesh (2009) conducted a study on use of information sources and services in library of Agriculture Science College, Shimoga. The study states that 72.27% of the users were using the lending service and among them 54.79% were satisfied. Services like SDI, ILL, CD-ROM search, etc. were fairly used, while non-documentary sources were less used. The authors concluded that there was an urgent need to establish an e-consortia model in the agriculture libraries in India.

Gowda and Shivalingaiah (2009) in their study on awareness and use of library facilities and services by the research scholars in the universities in Karnataka brought forward significant differences in the satisfaction level of research scholars of different disciplines with respect to the facilities and services of the libraries. Majority of the respondents belonging to humanities and social science found the facilities and services of the university libraries to be poor, whereas the respondents from the science group considered the facilities and services as moderately good.

The survey conducted by Haneefa (2006) on the Information and communication technology infrastructure in Special Libraries in Kerala revealed that though the libraries had hardware, software, and communication facilities to some extent, ICT-based resources and services were not reaching the users to the extent that was expected. The library catalogue was found to be the most popular area for automation. A good number of the library users were not satisfied with the application of ICT in their libraries and indicated "inadequate ICT infrastructure" as
their major reason for dissatisfaction. They proposed a variety of measures like formal orientation and training on ICT to become more effective users.

**Devendra et al (2010)** conducted a study on expectations of faculty members and research scholars on library resources and services of Sardar Vallabhbhai Patel University of Agriculture and Technology, Uttar Pradesh. The study found that faculty members and research scholars appreciate the services provided by the library, but at the same time expect more. There are a number of issues, such as lack of competent staff, etc. that create barriers in providing information services to the users. It is to make more effort to solicit the users' input on purchasing new books, periodicals, and other print and non-print information materials to better cater to the needs of the user community. A better policy should be formulated and implemented in order to improve the quality of the library collection. Focus groups, advisory groups, etc. could be established to solicit suggestions or recommendations on the information sources. A systematic training of the library staff on the use of the latest technology should be implemented to improve the quality of the library services. User orientation should be offered on a regular basis. There should also be some way for the users to judge the value of the library resources.

**Rao and Choudhury (2010)** in their study titled Computer Infrastructure Facilities and Services at NIT Libraries in India indicated that all libraries have a number of facilities for accessing communication network services such as telephone, internet, e-mail, etc., apart from the preferred library services such as online (e-journals), OPAC, CD-ROM, audio/video and support. However, the influence of CI facilities on library services clearly indicates that further improvement is needed. Further, the libraries require proper initiation, planning, management, and expertise to build their system and provide value-added services to the user for meeting their information needs.

**Wodeyar et al (2011)** in his study, attempts to know about the status of ICT infrastructure in the engineering college libraries in the Hyderabad - Karnataka region. It is observed from the study that majority of the libraries are not subscribing to the e-journals/e-databases and all the entire engineering colleges lack basic hardware and software infrastructure. The study also reveals that libraries are given least importance compared to other departments. A discouraging situation was found.
from the study that majority of the libraries have not been automated. A majority of the engineering colleges have internet connection through their institutes/college network. The study also recommends that all the libraries must subscribe to the membership of INDEST to assist the teaching and research fraternity. A minimum 6-10% of the total budget of the institutions should be allocated to the library department as recommended by the Kothari Commission (1964-66). It is also recommended that all the libraries should be automated and follow uniform standards for automation, and to provide separate Internet connection for each and every library should be made mandatory for all engineering colleges.

Fatima et al. (2011) examines the use of library services by the users of the Jamila Millia Islamia (JMI) and the Indian Institute of Technology (IIT), Delhi. The study shows that most of the users are satisfied with the various types of services provided by both the college libraries. JMI provides Internet and OPAC service but does not provide Web OPAC for its users and the IIT library provides the Internet, OPAC, and Web OPAC services to its users. Both the libraries have all types of collection. But the users of both libraries are not using periodicals and e-resources much as compared to their other collections. So it is suggested that both the libraries should publicise the periodicals and e-resources to the users. Some users of the JMI library are facing problems in using the OPAC. So it is suggested that the JMI library should provide training to its users in using the OPAC. A majority of the users search for information using the search engines as compared to electronic databases. So it is suggested that both the libraries should encourage their users for search information through the electronic journals and other sources. Also, JMI university library should provide Web OPAC for its users.

The results of a study by Khan (2011) on Information needs and information-seeking behavior of college faculty at Bahawalpur reveal that the current services rendered by college libraries are not fulfilling the information needs of the college faculty to a great extent. They use their personal collection in cases of urgency instead of visiting the library. Furthermore, they mostly rely on informal sources of information.
2.6 Use of Internet

The use of Internet is pervasive, rapidly evolving, and indicative of major changes in the fields of research, teaching, and learning. Today, the internet has become an important component in academic institutions as it plays a pivotal role in meeting the information and communication needs of the institutions and individuals. “It makes it possible to access a wide range of information, such as journal articles, papers etc, from anywhere in the world. It also enables scholars and academic institutions to disseminate information to a wider audience around the globe through having web sites and a way to search them and organize the output” (Luambano and Nawe, 2004).

The following works provide a background to the present study:

Hewitson (2002) concluded in his study on use and awareness of electronic information services by academic staff at Leeds Metropolitan University that the Internet is the most popular information source but the factors affecting its use at the expense of subscription-based services are complex. University staffs, especially those with low level information technology skills, frequently use the Internet because it is easy to access and provides instant results. But users who are aware and confident of using subscription-based services still prefer to use the Internet.

Kanaujia and Satyanarayana (2003) conducted a study of the science and technology community of Lucknow city (India) to assess the level of awareness and demand of web-based learning environment among the science and technology information seekers. The major findings of the study revealed that 49% of the users browsed the web for more than two to four hours, and 14 percent for more than five hours a day. The study further showed that 37 percent of the users consulted e-journals regularly on the internet, 40 percent used the Internet for consulting technical reports, a quarter to find online databases, and 10 percent for telnet service.

In the case study by Kelley and Orr (2003) which was conducted at the University of Maryland, it was shown that graduates students (69%) are significantly more likely to use the databases than their undergraduates (32 percent) counterparts.
Kumbar and Shirur (2003) conducted a study to elicit the opinions from the students, lecturers, research scholars, associate professors, and professors regarding the exploitation of Internet resources. The study found that about the academic community had started using the Internet for more than a year after the Internet facility had been provided at Shri Jaya Chamaraja College. Majority of the users learnt to access the Internet with the assistance of colleagues and friends and then through self-instruction, trial and error, through orientation programmes and handbooks and manuals. The study found that majority (39.24%) of the respondents faced some kind of difficulty in using it, some found the time slot insufficient, connectivity problem, irrelevant information retrieved and unawareness of the important sites relevant to their subject. It was also found that users are not satisfied with the physical facilities, downloading/printing facilities, access speed, and number of terminals and assistance from the staff at the computer centre. Based on the findings the study recommended extensive training programmes for all categories of the academic community along with installation of additional computers with printers so that the users can take printout of important documents. The capacity of the server should be increased. To avoid difficulty in accessing information at peak hours the timing of the Internet service should be extended for round the clock.

The study results of Asemi (2005) show that all the respondents were using the Internet frequently because all the faculties were provided with connections to the Internet. It was revealed that the researchers of the university were getting quality information through the Internet. Indeed, over half the respondents searched for scientific information through the Internet because the university library had provided access to various databases and online journals for all the students and staff.

Kumar and Kaur (2006) conducted a survey on 792 teachers and 1,188 undergraduate students of the engineering colleges in India’s three states Punjab, Haryana, and Himachal Pradesh. They examined Internet use pattern of these respondents to see whether the Internet worked as a substitute to the library services. The result revealed that the Internet had become an important tool for teaching, research, and learning.

Kumbar and Vasantha (2007) conducted a study on Use of internet in Engineering colleges of three districts of Karnataka State. The study found that
92 22% of the total respondents use the Internet only for e-mail, and 53 33% were not satisfied with the printing and downloading facilities available in their respective colleges. The study recommends that necessary training be provided to the faculty and students to make use of the information resources available on the Internet. Downloading and printing facilities should be extended to the students. Internet connectivity should be made available to all the departments and laboratories of the engineering colleges under study.

Khare et al (2007) conducted a survey of Ph. D. Scholars on Internet as a source of information. The study found that the rate of Internet use is more in research scholars of science, life sciences, engineering, technology, and management faculties as compared to the faculties of Arts, Social sciences, law, education, and commerce. Research scholars use the Internet for research purposes, entertainment as well as for job search. It is suggested that the university should conduct training programmes and make it mandatory for all the research scholars to attend the same. The university needs to improve the Internet facility by adding more computer systems for Internet use and some of them should be earmarked for the exclusive use of Ph.D scholars. Broadband connection can greatly enhance access time. Internet connection should be available in individual departments and research scholars should be encouraged to use the same. The study also found that 66% of the respondents use the Internet for research purposes and this shows that research scholars are aware of Internet services and realise its immense importance to their research work. The study also shows that the respondents are unable to search precise information and are not satisfied with the number of computers available for Internet access, the speed of connecting, and the timings allowed for Internet access.

Saravanan and Mary (2007) in their thesis titled Teachers approach to internet and online information resources revealed that quality consciousness among college teachers is poor and the users approach to the Internet and online information resources are similar to that of the traditional print media. Based on the analysis of the data, the study found that the purpose of using the Internet sources by a majority of the college teachers is for the preparation of classroom teaching. Teachers depend more on traditional source than e-source. Further, it has been found that the knowledge of college teachers towards various quality parameters such as filtration, currency of
information, supporting system, copyright, and reliability of information was poor. Computer phobia and non-availability of Internet facilities was the reason for some teachers to stay away from using the Internet. The study recommended compulsory computer literacy training through seminars and workshops periodically for college teachers at regional as well as national level. The IT orientation courses part of the curriculum may be centered on a step by step method of browsing, conducting search strategy, and how to filter the information accessed on the net.

Chouksey (2007) in a Library web page web study of libraries of Indian council of Social Science Research Institutes found the different type of internet connections and services available in the libraries and the status of the web page of the library available on the Internet. It was concluded from the study that 82 percent of the libraries are virtual in form of www internet, 32 percent of the surveyed libraries provide information and services like name of the library, timing of the library, services of the library and staff of the library on their webpage. It can be concluded from the above study that most of the responding libraries having the simplest library software that is compatible with the computer's 486 platforms. Some respondents who are using the advanced modules with latest and upgraded software require the computer with the multimedia platform for advancement of library services and housekeeping jobs.

Sujatha and Mudhol (2008) conducted a study on use of electronic information resources at the college of Fisheries, Mangalore. The study found that majority of the respondents browsed the Internet for subject specific information websites and for international/regional institution websites and found that the e-mail was the most frequently used electronic information source, followed by web resources. It is also found that retrieval of irrelevant information, poor connectivity or slow access and poor database searching skills are the major problems identified by the respondents in the use of e-resources. The study recommends increasing bandwidth of the internet and making available computers with latest processors for use.

Kaur and Manhas (2008) conducted a study on use of internet services and resources in the engineering colleges of Punjab and Haryana. The study showed that all their respondents made frequent use of the Internet because they had access, either
at college or at home. The survey revealed that the majority of the respondents, i.e., 66 percent, access the Internet from the college or their workplace. More than 75 percent of the respondents used the Internet services mainly for educational and research purposes. More than 70 percent of the respondents feel that the Internet is useful, informative, easy to use, inexpensive and time-saving.

Rao and Choudhury (2009) conducted a study on Library Automation Facilitation: A Case Study of NIT Libraries in India to identify the extent of computerisation in the National Institute of Technology (NIT) libraries across India. The study also looked into the integrated library software (ILS) and its management, automation of library in-house functionalities, and tried to evaluate the zone performance with respect to computerisation. The results of the study show that almost all the NIT libraries have acquired ILS, and a majority of the libraries have automated their cataloging systems. However, the study makes it clear that automation facilitation among NIT libraries is still in the developmental stages due to various technical, professional, and administrative reasons.

Parameshwar and Patil (2009) conducted a study on use of the internet by faculty and research scholars at Gulbarga University Library. They highlighted that a large portion of the user population in the university are aware about the Internet, but they do not know all its techniques and applications. Further, a few users in the university still have no knowledge about the Internet and its related applications. Therefore, the study recommended providing user education to the users for the effective use of Internet.

Arya and Talukdar (2010) study on use and effectiveness of internet services and resources in the Delhi College of Engineering library found that most of the users use Internet as the main tool or source for finding information. Therefore, the study recommends that the library should subscribe to more web-based resources, conduct a users’ survey for assessing the needs of the users, and take the initiative in organizing orientation programmes and provide short-term training courses on the basis of IT skills.

Esmail et al. (2010) examined the characteristics and Internet using behaviour of the respondents studying in the engineering college at the Thiruvannamalai
The results on the frequency of using the Internet shows that 33.33% of the respondents are daily users of the Internet and majority of the respondents used the Internet for the purpose of sending and receiving e-mail. The findings on the extent of difficulty in accessing the Internet shows that slow accessibility, searching, browsing, and downloading are the major difficulties faced by the users. "Don't know how to use it" was the major reason for not using the Internet and its services, by the respondents.

Mulla et al (2010) on the usage and performance of various library software modules in the engineering colleges of Karnataka gives a status on the software packages used by various libraries and the opinions of the librarians about the performance of the different modules of the software used. It was observed that serial control and acquisition modules were being used less by the librarians because the acquisition process differed from software to software, and from library to library. To be a part and parcel of the library information system development process, it is suggested that the library staff should respond to the developments in technology and keep up to date with the technologies available, they must evaluate technologies, so that they can make informed decisions about using these technologies, and should develop practical plans for implementing them. The impact of library automation on the services of the responsive libraries has increased in terms of ILL, users’ visits to the library, and help in building an appropriate collection.

Barik et al (2011) in his study found that the present status of the libraries in the private engineering and management colleges of Orissa is not on par with the contemporary libraries of other states of India like Andhra Pradesh, Tamil Nadu and Karnataka. Many libraries are functioning in the hall designed for classroom purposes. The infrastructure for ICT is not adequate to meet the need of the users. The activities of the libraries are not fully automated. The study suggests that, the management of the colleges should take immediate steps to modernise libraries with modern technology to provide better user service to the patrons. The college libraries should be designed with proper library building plan and it should be an independent library building. Print and non-print resources should be purchased to meet the needs of the students as well as of the staff.
2.7 Problems Faced in Searching for Information

Sangam and Hadimani (2004) examined the use of online public access catalogue by the research scholars in Karnataka University Library. The study examined the frequency of use and purpose of consulting OPAC, difficulties in locating books, periodicals and other reading material. Some users suggested for an up-to-date library guide which would explain on how to use the catalogue.

Al-Saleh (2004) in his study on graduate students' information needs from electronic information in Saudi Arabia found that only half of the students used electronic information resources. The study showed that students' situations are diverse in terms of gender, age, academic degree pursued, academic major, English language proficiency and the Internet use. All of these situational variables affected students' use or non-use of electronic information resources. Despite extensive availability of electronic resources, many graduate students preferred to use printed books and documents, from other university libraries, rather than electronic databases or the Internet, and the electronic information resources purchased by university library found to be underutilised.

Hartmann (2001) in his paper understanding of Information literacy the perception of first year undergraduate students at the University of Ballarat, concluded that undergraduate students experienced difficulty in locating items from the library collection and did not understand the process for retrieving journal articles.

Sendikadiwa (1996) evaluated the library-use instruction programs to first year students in Makerere University. He observed that although the catalogue was the most essential library tool in accessing the library collection, it was the most avoided and least consulted by the undergraduates. Evaluation of library-use instruction programs to Kamanda (1999) in a study on library use by university students observed that more than half the students experienced problems in locating the library information materials. He noted that majority of them either located materials by browsing through shelves or sought assistance from the library staff, did not make full use of the card catalogue.
Liao, Finn and Lu (2007) study on Information-seeking behaviour of international graduate students vs American graduate students demonstrate that the impact of language/culture, communication barriers, and technology barriers on the international students' access to the libraries has decreased. The study suggests the setting up of some basic library programmes, which would concentrate on the introduction of various library services, online discussion forums, and group workshops, and could be set up to help the students become more familiar with the university libraries and make full use of its various services.

Achonna (2008) conducted a study on awareness, access, and usage of e-journal resources of the library by the students of Yaba College of Technology, Nigeria. The study observed that the use of e-journal resources was found to be low due to lack of skills, inadequate provision of computers, power outage, etc. The study concluded on the need for training skills, provision of adequate computers, need to popularise the information technology and its usage, and to motivate the students to use the e-journal resources.

Lohar and Kumbar (2008) conducted a study on use of CD-ROMS and internet resources by the students in JNN College of Engineering, Shimoga. The study found that significant numbers of users are unaware of the existence of digital resources in the library. The study also found that the majority of student community faces problems while searching for information in the CD-ROMS and on the Internet due to lack of hardware and software training. Hence, the study recommended providing basic training in using these resources.

Sharma (2009) conducted a study on use and impact of e-resources at Guru Gobind Singh Indraprastha University (India). The study found that a majority of the teachers and research scholars are dependent on the e-resources to get desired and relevant information. But the practical use of e-resources is not comparable to the investment made in acquiring these resources, secondly, the infrastructure and training programmes be revised as per the requirements.

Singh and Arora (2010) on the use of e-resources in the college libraries found that, although e-resources are available on the website of the Delhi University Library system but the practical utility of them in the college libraries by the students.
and teachers are not up to the mark. Lack of ICT infrastructure, trained manpower, user demand, financial support, computer access facilities, knowledge about the access of e-resources, and training for the digital access, etc. hinders the ability to meet the requirements of e-resources for the students and teachers in the college libraries. It is recommended to provide training to the teachers, students, and librarians for the effective use of e-resources. The study also suggests improving the infrastructure for easy access of e-resources by the users.

The findings of a study by Yusuf and Iwu (2010) revealed that 88% of the respondents visited the library to study for the examination while most of the faculty visited the library to read the journals in either electronic or print form. It is recommended that the faculty should give reading assignments that will require the students to consult the journals and other resources in the library, and not just use it for examination purposes. It was opined that the library should organise a "library week" each semester to showcase the various resources available in the library.

Latha and Nagarajan (2010) found that the use of ICT and e-resources is very common among the scientists and research scholars of the Special Libraries and a majority of them are dependent on the ICT and e-resources to get their desired and relevant information. It is observed that the availability of e-resources in the Special Libraries is almost sufficient for all the existing disciplines but the infrastructure to use these resources is not adequate and can hinder the ability to meet the requirements of the users.

A study by Raju (2010) on the use and user awareness of electronic resources in the Andhra University reveals that despite the availability of a wide range of e-resources, the frequency of their use was low. The reasons identified for this were lack of time, lack of awareness, lack of subject coverage, and slow downloading.

Vasanthi and Ravi (2010) studied the impact of e-resources and user perception in professional education. They found that the purpose of using e-resources differs from one user to another. It was inferred that all the users give importance to use of the e-resources for their academic and research activities. The major barrier to access e-resources is the Internet speed. Inadequate familiarity and training are the other affecting factors. A significantly low usage was reported for e-books, online
databases, and e-journals. This attitude might be as a result of lack of awareness about the e-resources provided by the library. Wi-Fi will facilitate a large number of users to access the e-resources on their laptops. The study has highlighted the existing situation of the internet service provided by the professional colleges. Information on the Internet is not easily available in an organised manner and the users should be able to get precise information from the internet. Hence, it is mandatory that the librarian should create a library portal and be able to obtain the right information at the right time.

Kinengyere (2012) studied the factors affecting the utilisation of electronic health information resources in the universities of Uganda and found that lack of awareness of the available resources, limited number of facilities not matching the number of users, and lack of skills to make productive searches affect usage.

Thanuskodi (2012) studied the use of Internet and electronic resources among the medical professionals and found that the respondents experience problems in accessing e-resources in terms of virus, difficulty in using the digital resources due to lack of IT knowledge, and limited access to computers. The study recommends that the education curricula should accommodate the integration of information literacy. IT staff should be appointed to provide expert guidance to the user on the use of e-resources and the Internet.

2.8 Role of Librarian and User Education in Promoting Information Resources and Services

Globalisation of technology and increase in the quantity of information from all sources of information, namely, various types of documents, media, and the Internet have raised questions about information authenticity, credibility, and reliability. The uncertain quality and expending quantity of information poses large challenges to information users and information science professionals. In such a situation, only dissemination of information is not sufficient, the user of the information centre should be taught to make the best option provided to them to enhance their knowledge as well as to associate the knowledge skills to perform a particular task. Information science professionals should teach the user to go beyond
the physical boundaries of the library to seek knowledge and quickly learn to use
other learning resources like the Internet facilities, etc

Users need to learn to retrieve information and also organise, evaluate, and
communicate. In this sense, in addition to acquiring library skills, there is a need to
impart learning and communications skills. Faculty and library staff should share this
programme in order to make it successful in the real sense. For the overall socio-
economic development, information is an indispensable resource. But this resource is
not fully exploited by the users, even by those who are more knowledgeable simply
because they are not aware of the treasures in their libraries or how to use them.
Library professionals should be well aware that starting or improving an users’
information skills is an urgent issue and will pay dividends in the long run in all
aspects and will have significant long-term impact on the development of science and
technology.

The user is the key person in any library and information system. All the
luxuries of the information revolution and problems of the information explosion are
centred round the users and their convenience. Therefore, as Prasher (1993) writes,
understanding the user is half the battle in providing information services, as the
success of any information system depends considerably on the extent to which the
system design is based on the close and accurate understanding of the user. Thus, an
information system is not concerned with just demand, but in the libraries it has to
stretch out to know the information needs, motives, and purpose of gathering
information, ways and means of gathering information, user attitudes, and practices in
relation to such information. Hoadley and Clark (1972) write that a library can
achieve its goals if it is more precise about who its readers are. This precision,
coupled with more research into the behaviour of information gathering patterns of
these user groups, will assist the library more effectively in making progress and
using its resources and limited funds to achieve the desired goals.

It is, therefore, advisable to take into account the results of the studies of
information needs and user behaviour, when designing the information teaching skills
(ITS) programme. Wilson (1977) states that the investigation of information use and
user needs should form the basis for training purposes. Others like Fjallbrant and
Malley (1984), and Laburn (1984) are of the same opinion. Bhargava (1992) views
that in higher education, classroom lecturing should not constitute more than two-thirds of the teaching system. In professional courses, the proportion of formal lecturing could be reduced even more and greater emphasis can be laid on guided self-study.

Following are a few studies that point out the librarians’ role in user education in libraries:

**Rashid (1997)** assessed the user education in Indian libraries and found that to materialise user education programmes, all necessary facilities should be provided. He further appeals to the library professionals to act on the proverb “first deserve then desire.” They should receive more specialised training and also get themselves trained and retrained in the modern techniques of information technology, marketing of information, assessment of information needs, and information seeking behavior, and public relations (especially while dealing with higher levels of management, who are also the providers of funds), not only during their professional training at the library and information departments, but also as part of their continuing or in-service education. In this connection, it is also suggested that the curriculum of the library and information schools be redesigned as per the requirements of the times. It is also recommended that the departments of library and information science should start short courses on training information skills and all librarians should attend such courses.

**Foss (1974)** in his study on reader instruction at Fourah Bay College Library disagrees by arguing that user education should be organised at different information levels to ensure that the needs of all students are met. This argument implies that the training should be organised around the levels of difficulty and the user’s educational background.

**Tiefel (1995)** noted by examining the library user education in past, projecting its future that, most library users are unaware of the quantity and variety of information available. They are often satisfied with materials that an experienced librarian would find wholly inadequate and/or inappropriate. Unless librarians educate users about finding information, users will continue to under utilize and misuse information.
The introduction of technology into teaching, changes in scholarly communication patterns, the increasing variety of media, more demanding students requiring services to be available as, when and where they want them, all require that librarians ensure, even more than ever, that they are user-focused, user-friendly, and able to assist users to gain information literacy skills which will enable them to be to a great extent self-sufficient. McGeachin (2004) in his article reviews possible scenarios that scholars can use to manage the new electronic collection of research articles and possible ways by which libraries can help them in this scholarly activity.

Anuradha and Usha (2006) conducted a study on use of e-books in an academic and research environment from the Indian Institute of Science. The study found that e-books are hard to read and browse, therefore the users used printed books and do not want to change the habit. Many suggestions were given for improving the e-books (e.g., by reducing the time taken to browse the pages) and for creating awareness among the users of the existence of relevant material. Thus, it is recommended that through user education, publicity, raising awareness about the software/hardware used for e-books, increasing the bandwidth, and making e-book reader devices available along with e-books through the libraries, the use of e-books can be increased.

Haridasan and Khan (2009) conducted a study on impact and use of e-resources by social scientists in National Social Science Documentation Centre (NASSDOC), India. The study indicates that respondents are aware of the e-resources. A large numbers of research scholars and faculty members are using these e-resources for their research work. Many faculty members strongly agreed with the necessity for computer and Internet literacy to access information.

Tadasad et al. (2003) in his study Use of Internet by undergraduate students of PDA College of Engineering, Gulbarga, observes that Internet use is confined to general and recreational purposes and its potential to support the curricular requirements has not been realised by the students. He concludes by saying that awareness needs to be created among the students for using the Internet in addition to the library facilities, and training should be provided to acquaint students with the Internet and its resources. These obstacles have to be overcome in order to promote
the use of the internet and necessitating extension of training facilities, not just technical training, but training to overcome techno-stress, fear, and anxiety

Kanniyappan et al (2008) conducted a study on use and impact of e-resources in an academic and research environment. The study revealed that majority of the respondents (53.3%) used e-journals for research purpose. 52.7% used e-journals and 32% used both electronic and print journals. The major problem faced by the respondents in using e-resources was lack of information about how to use them.

Fatima and Ahmed (2008) conducted a study on information seeking behaviour of the students at Ajmal Khan Tibbiya College, Aligarh Muslim University. The study found that ninety percent of the students agreed that students needed instructions on how to use the information source in their subject area for effective and efficient use of the information sources and services.

Rowena (2011) evaluated the impact of information literacy training among the junior doctors during the post clinical years. The study found that most participants recalled the training they received, but had not retained the high-level search skills, and lacked skills in identifying and applying the best evidence. There was no apparent link between the type of training given and subsequent skill level. Postgraduate education required these skills which were more successful in retrieving and appraising information.

A study by Idbris, Kumaravel and Premalatha (2012) on the information seeking and usage in the digital environment revealed that the Internet has a great impact on the information-seeking behaviour of students and scholars. They faced many problems in retrieving and using the electronic facilities. To improve the provisions of the modern information technology, it is suggested to provide more computers in the library. It is also suggested to conduct more information literacy programmes on a periodical basis. Training programmes have to be conducted in using and culling out information from the Internet. The librarians working in the university libraries should also enhance their skills in providing information to the users.
2.9 Information Literacy and Training

Information is the basic force that drives the society “Good decisions depend on good information. Information is the lifeblood of our democracy. But information is power only if we know how to find the best information and apply it to the decisions we make in our work and daily life” (ALIA, 2003). Ushered by the increasing information production era, information is not limited to merely library and information centres, it is available through a number of sources, it may be a video film, a drawing object, graphic records, personal computers, Internet, and so on. As a result, information comes through unfiltered. The immense proliferation of resources, media and technologies for access and use of information have necessitated that the users are equipped with appropriate capabilities of information literacy” (Rehman and Alfaresi, 2009). As rightly said by Toffler (1991) that the illiterates of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn. Information literacy is the basis of lifelong learning. Professor Paul Zurkowski, President of the Information Industry Association, coined the term “Information Skills” to refer to people who are able to solve their information problems by using relevant information sources and apply relevant technology. Gradually, after replacing the terms user education, library orientation, bibliographic instruction, information literacy became a prime factor in attaining knowledge and developing new understanding.

American Library Association (1989) defines an information literate person as one who is able to recognize when information is needed, and to locate, evaluate, and use the needed information effectively. UNESCO (2008) includes information literacy skills as part of the wide-ranging information and communication technology (ICT) literacy skills. A student who possesses ICT literacy skills should be able to recognize information needs and use information and communication technology (ICT) features and applications to access, retrieve, store, manage, integrate, evaluate, create and communicate information effectively. In addition, he or she should also understand the ethical and legal use of the information. Amudhavalli (2008) identifies an information literate individual as one who able to

- Determine the extent of information needed,
- Access the needed information effectively and efficiently,
• Incorporate selected information into one’s knowledge base,
• Use information effectively to accomplish a specific purpose, and
• Understand the economic, legal and social issues surrounding the use of
  information, access and use information ethically and legally

The information resources available of multifarious kinds are in abundance. The resources range from printed documents, e-resources, webpages, online databases of full text journals, and other multimedia format. In this age of flooding information, also librarians are able to tell the users regarding the potential resources build up suitable devices to help in searching the relevant sources, and to an extent help the user in evaluating the retrieved resources. Hence the role of librarians is confined to educate the users to take advantage of the new and emerging technologies. The study shows that the respondents seriously lacked the necessary knowledge and skills to evaluate Internet information, to identify the most efficient search strategy, to use scholarly resources, and to use the information ethically. Most scholarly resources used were books in print format, while most non-scholarly resources referred to were in electronic format. Thus, engineering students, faculty members, and research scholars need to be equipped with strong information literacy skills to succeed in their academic and future professional endeavours. Some important studies are reviewed on the subject which are as follows:

Erdmann (1990) in his study on improving the information-gathering skills of engineering students observed that in order to equip students for effective information gathering and seeking, they need to be given certain skills in order to “plan a search, use variety of materials, locate materials and use citations.”

Ackerson and Young (1994) evaluated the impact of library instruction methods on the quality of student research. They observed that engineering students are among the least likely of students enrolled in the science and technical disciplines to know about unused literature in their field. Since this behaviour appears to be characteristic of the engineering profession as a whole, it is even more important to teach information literacy skills from the freshman year of college. “A steep increase in the volume of information produced in the science and technical fields, along with its evolution into electronic format, means that teaching existing knowledge is
becoming less important than teaching effective information gathering skills—skills that will enable engineers to cope with the ever changing knowledge landscape.” Since engineering students typically value accessibility over quality when choosing information sources, it seems even more important to teach them how to critically evaluate the material.

Ellis and Haughan (1997) in their study modelling the information seeking patterns of engineers and research scientists in an industrial environment state that since the information needs of an individual vary greatly as she/he progresses through even a project, this must be taken into account when training students.

According to Bracke and Critz (2001) library instructions for engineering students need to be “specific, context based and highly relevant to their current information needs.” It is also important to teach students in a manner which will allow for the greatest retention of the material and this is the key to the success of library instruction for engineering students.

Nyamboga and Kemparaju (2002) concluded in their study on information technology in University libraries in Karnataka that libraries still lag behind some other Indian universities in the application of information technology, but the introduction of Internet access is an important step forward. Regardless of a not very good picture of the information technology application in Karnataka, finally, with basic information technology literacy, library users and staff are able to retrieve more up-to-date information that supplements what they get from printed information sources, thereby increasing the efficiency and effectiveness of the academic libraries as well as helping to bring the whole institution into the information age.

Finn and Johnston (2004) in the study index use by engineering faculty and students identified “the need to plan for better information literacy instruction” based on an engineering faculty and student survey.

Kimengyere (2006) conducted a study on the effect of information literacy on the utilization of electronic information resources in selected academic and research institutions in Uganda. He found that availability of information does not necessarily mean actual use. The study shows that some of the available resources have not been
utilised at all. This means that the users are not aware of the availability of such resources, they do not know how to access them, or they do not know what the resources offer. All this calls for continued information literacy programs. IL is very vital in influencing utilization of e-resources. Information professionals are needed to pass on IL skills to library users, while library users should endeavor to find out what information is available online for their consumption. Their attitudes and perceptions also influence the level of utilization.

Roberts and Bhat (2007) in their study on innovative approaches to information literacy instruction for engineering undergraduates at Drexel University state that, information professionals, engineering librarians have the primary responsibilities of providing access to engineering information resources and giving instruction in how to use these resources.

It is evident from the study conducted by Baer and Lisha (2009) on library and information use patterns by engineering faculty and students that students are not familiar enough with resources. Librarians must be relative in finding ways to reach and educate them. Adding online tutorials to augment traditional training methods is a promising way to reach more students. Information literacy approach needs to be reviewed. A single method is no longer sufficient to reach all students. Traditional methods work, but they are not enough. Students prefer online tutorials for library training.

Shivalingaiah and Gowda (2009) conducted a study on facilities and services in University Libraries in Karnataka from the researchers’ point of view. They found that even though the resources, facilities, and services are available in the university libraries, due to the ignorance and lack of training on “how to access them,” research scholars waste their time, energy, and money in searching for information. This can be prevented through proper training programmes by the professional experts. Hence the study recommends the introduction of intensive training programmes for the research scholars on the use of resources, facilities, and services, more particularly the use of electronic resources, online journals, databases, and their use for the research, CD-ROM search and retrieval skills, and how to write references and citations, and organise programmes by the experts in the respective fields.
Choudhury and Sethi (2009) conducted a comprehensive study to identify the information literacy level presented by the library professionals of three academic libraries of the major universities in the state of Orissa. The results of the study clearly indicated that 77.7%, 75%, and 44.4% of the library professionals in the three libraries surveyed were computer literates. The study suggests that library professionals should be encouraged and deputed by the authority to attend seminars, workshops, conferences, training/orientation programmes on library management software, IT tools, search techniques and use of search engines to perform competently in the automated and digitised environment.

Hadimani and Rajgoli (2010) conducted a survey of the College of Agriculture, Raichur with an attempt to assess the information literacy competency among the undergraduate students. The outcome of the study revealed that though the majority of the respondents had the ability to locate the needed information, they lacked competence in the electronic access to information. On the basis of the findings, necessary suggestions were made by the researcher for implementing proper information literacy competency programmes in the college.

Hart (2010) addressed the issues faced by universities of technology, where the students were studied in terms of two workshops that allow them to search data related to their essay through online public access catalogue and engineering databases. The results of the study suggest that a timetable must be distributed for information literacy activities to the users.

Fatima et al. (2011) in her Use of library portal by Engineering and Technology students of Aligarh Muslim University a survey found that majority of the students use library portals but not regularly. The study also found that the reasons for not using the library portal were lack of awareness, training and guidance, and the lack of contents on the library portal. Majority of the respondents also expressed that they needed instructions and help for the effective utilization of resources on the library portal. The study recommended that more and more information literacy programmes should be conducted by the libraries to enable the effective use of the library portal.
Baro and Endouware (2011) conducted a survey of the College of Health Sciences in the Niger Delta University (Nigeria) to assess the information literacy skills among medical students. The results revealed that the students of college did not have the necessary skills to search the electronic databases and they mostly relied on text books, medical journals, colleagues, and the Nigerian National University Commission's virtual library for information. The problems faced by the students in searching for information were also described in detail. On the basis of the findings, the researcher recommended that the medical librarian and the faculty should collaborate to integrate information literacy skills into medical school curriculum.

Kaur and Sarman (2012) conducted a study on the study information literacy among the students in the electronic environment of Punjab Agricultural University. They discovered that the status of the information literacy skills of the students, their information seeking strategies and ability in acquiring, organising, evaluating, and using the information effectively. Majority of the respondents do not have the ability to identify citations and only 46.59% of the respondents make fair use of the information. The study suggested that the information and research skills course should be made a part of the curriculum of the courses of the university. The university library should start an alerting service such as e-mail or SMS alert to all its members about the new additions of the library. The faculty and the librarian should collaborate to produce information literacy content and to make the students aware about the new technology and techniques for effective use of the information.

Hadagali et al (2012) investigated the use of electronic resources by the postgraduate students in different universities in Karnataka State. The study found that the information content in electronic resources is better than that of print versions, most of the users access electronic resources to search bibliographical information. The study indicated that they learnt to access the electronic resources by trial and error and through friends. This resulted in the users' wasting their precious time and effort which can be avoided. Hence the study suggested that the authorities of the library should develop new information literacy programmes, which impart required skills to users in accessing electronic resources.
2.10 Inference

This literature review is based upon the research that has already been done in certain areas or disciplines that relates to the current study. From this literature review study, the following findings about the user's information need and seeking pattern of information resources can be drawn:

- Engineers need current information to keep up date in their respective fields.
- Scientists and Engineers rely most heavily upon their friends and colleagues to fulfil their information needs, because they are better able understand the user's requirements and can communicate their own ideas more effectively to the user, technical colleagues who are also members of the user’s organisation are the most effective of all human information sources. Internet surfing, attending conferences/workshops/seminars/refresher courses and other library and information centres have widely helped the users in seeking current, updated information in their respective fields. Ease and speed of use were considered as the most important criteria for selecting particular ideal sources.
- The main purpose of their visit to the library is for academic and research work. They consider text books, journals, and newspapers and magazines as important information resources. Still among few users print resources were preferred over electronic resources, reportedly because of convenience, reliability, and ease of use. Faculty members and research scholars consult OPAC to locate the required reading materials whereas students seek the help of the library staff. Online catalogue and library staff are the main information search strategies among the users.
- Internet plays an essential role in academic libraries. There is a high degree of awareness about the benefits of the internet among the users. The main purpose of accessing the Internet is for education and for e-mail communication. The home/hostel and departments, cyber café, and library are deemed to be most convenient places to access the internet.
- The work environment of the individual requiring information, the importance placed on getting it, the facilities and services available for seeking it, the
knowledge about these facilities and services, the judgment of their value and the probability of getting what is wanted affects the use of the information resources. Regarding the selection of a source, source quality and access difficulty are important qualities of source use, regardless of the source type. Moreover, seekers place more weight on source quality when the task is important.

- Lack of knowledge about the library resources and services contributed to low library usage.

- Lack of time, information overload, lack of equipments with IT infrastructure for online searching and the Internet, lack of space, lack of availability of current journals, insufficient skills and training were the top barriers to the use of information resources.

- There is need for the computerisation of library services, interlibrary connection, current awareness services, and improvement in the interpersonal relationships of the library staff as a means to improve the library service.

- Awareness and use of the available information resources requires some information literacy through the user education for both, users and library staff. User education programmes should aim to make all the users aware of the information resources available, both directly in the library and from external sources and enable the users to enjoy the search for information. Libraries should not only see themselves as users of the Internet, but also as providers of information from the Internet. There is a growing need to support the users in the form of training to equip them with skills needed for the effective exploitation of the online resources.

An academic library must be aware of the needs of all its users and that libraries as social institutions are shaped by their societies because they are needs-oriented. There is a general agreement or rather we all agree that a college library exists primarily to serve the needs of the users of its own institution. However, if the library is to fulfill that prime function, it must provide facilities for study, teaching, and research, which are geared as closely as possible to the academic mission and pattern.
of the university. In conclusion, it should be noted that most of the literature that has been consulted was not strictly based on the engineering college libraries. Therefore, the sources that have been consulted reflect quite a broad coverage of the Science and Technology literature and libraries. Hence, the literature of the libraries and other engineering college collections were examined as the main themes of this dissertation.
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