Chapter 2

REVIEW OF LITERATURE

The emergence of information technology has changed the way information is stored and disseminated. Libraries are fast in adopting these changes and transforming the library from a traditional library whereby collections were in print format to a modern library whereby print and electronic resources are available side by side. The term "hybrid library", became common to describe the various types of information resources in the library. Hybrid libraries, standing between traditional library and the virtual library, are increasingly becoming the norm. Increasing demands for digital services from librarians in many areas has opened the opportunities in the information management that librarian can best provide. The literature review is done to provide a background of the use of electronic information resources. It also seeks to provide a background of users' perceptions and factors that affect the use of these information resources in this emerging information and communication technology era. This review also acted as a guide to design the present study.

The aim of this study is to identify the level of usage of electronic information sources and services among academic community in Engineering Colleges of Assam. It also attempts to find out the barriers in using the electronic information sources in teaching and learning processes. The researcher started the review of literature covering from macro to micro, appearing in both printed and digital forms. The UGC-INFONET e-journal consortia of INFLIBNET resources were searched in the Department of Library & Information Science, Gauhati University and later in Rabindra Library, Assam University. Documents available in different universities and higher educational and research institutional libraries including University of Hyderabad, University of Burdwan, University of Delhi, University of North Bengal, Dibrugarh University, NIT, Silchar, Indian Institute of Technology- Delhi, Guwahati, Biswa Bharati University, Santiniketan, Guru nank Dev University,Amritsar, Gujrat University, IIM Ahmedabad, NEHU Shillong,
Mizoram University, Bose Institute Library, Kolkata, Kashmir University Library, Srinarag, University of Lucknow, NISCAIR Library was also searched. Articles for the literature review are mainly collected online from databases such as Emerald, Springer, JCCC/UCC INFONET. Some of the articles are also obtained from the Internet and from library subscribed journals. Regarding Open Access resources, the scholar mainly searched Firstmonday, Webly, Libri, Webology, Information Research etc. The term used to search included engineering education, information resources, print and electronic resources, electronic publishing, electronic journal, online databases, online resources, information development and technology. More journal articles are consulted because of very little research-based literature on the topic of “Use of web base resources in the engineering college libraries” could be found. This may be due to the development of the information technology, where many articles have been written about use of electronic journals, electronic resources and Internet. These articles are used and consulted. The literatures are being arranged under three subthemes (chronologically) for better understanding. Though most of the literatures deal with multiple aspects, still they are grouped according to the emphasis of the concept. The sub-themes are

i. Engineering Education in India and Assam

ii. Availability of Web Based resources for engineering community

iii. Use of Web Based resources by engineering college libraries

**Sub-theme 1: Engineering Education in India and Assam**

According to Ackerson and Young (1994), engineering students are among the least likely of students enrolled in the science and technical disciplines to know about and use the literature in their field. Since this behavior 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 material.

Youngman (1998) studied the "Changing Roles for Science & Technology Librarians As Reflected in the History of Engineering Index" revealed that Patron service today involves the use of a broad spectrum of complex information tools, coupled with the librarian's understanding of the literature, the research process and specific patron needs. The history of Engineering Index, beginning in 1884 and continuing to the present, provides a context for examining how the practice of user service in science and technology libraries has changed over a period of more than a century. While the goal of excellent information service has remained a constant, the nature of the tools and the role of the librarian have changed markedly. Engineering Index has been a primary information tool for technical librarians for over a century. Science and technology librarians are continuing to earn the respect of their patrons, and it seems certain that the future will see further development of the role of librarians and of tools such as Engineering Index.

Quigley and McKenzie (2003) examined the probability of "Connecting Engineering Students with the Library: A Case Study in Active Learning" and revealed that delineates the evolution of classes from lectures to active learning classes. Working closely with the instructors, the authors have developed classes to meet four library instruction objectives in the context of course goals and assignments. The changes have been guided by feedback from instructors and students, as well as the continuing education and cumulative experience of the authors as teachers.

Ahmad and Satija (2005) studied the development of technical education in India with special reference to Punjab and reported that India had made considerable progress in the field of engineering and technical education over the last twenty years. Till 2004 Punjab was having 39 technical institutions with 12087 intakes to train the students in engineering areas of engineering and technology to cater the need of Punjab.

Saravanan (2005) studied on "The Economics of an Indian Engineering College Library" and concluded that The library is one of society's forms of cultural self-expression. In India, the development of higher education is closely associated with the steady growth and development of the library in the institution of higher learning. An academic library is
affiliated with an academic institution, be it a school, college, or university. A college library, of which an engineering college library is one example, is a service component of its parent body, and since it is a non-profit organization, it must manage its finances in a judicious manner. At the same time, library services are increasingly expensive.

Margaret Mellinger (2007) explained Library as a Laboratory and presented a project-based collaboration between a usability engineering (UE) course and the campus library. Student teams developed UE projects based on usability issues they identified in the library's web-based and information technology services. Using the library as a focal point, students practiced common UE methods such as ethnomethodological observation, web usability evaluation, and an iterative prototype process based on cycles of design, testing and evaluation. At the end of the term, teams of students presented their novel solutions to library staff as part of their final grade. Other academic librarians may find inspiration to pursue similar partnerships on their own campuses.

Bhattacharyaa (2008) said Engineering education in India has witnessed a major change over the past few years. Substantial increase in the demand for high-quality education has led to the adoption of Information and Communication Technologies for extending the outreach of education. Important developments include the National Programme on Technology Enhanced Learning (NPTEL), the use of an educational satellite called the EDUSAT and various other approaches such as the use of ‘virtual classrooms’ and ‘virtual laboratories’. The author goes on to discuss some of the problem areas in the present mode of dissemination and deployment; some possible future trends and modalities are also outlined. These include blending collaborative learning with interactive technology-enhanced learning initiatives and finding ways of providing support for learners' queries.

Banerjee and Muley (2008) stated that the engineering course in India is one of the preferred choices for students who have scored high at the 10+2 level. The competition for the top institutions is intense with students spending a lot of time and money in coaching classes to get the added edge at the competitive entrance tests. This increasing demand for engineering has resulted in a mushrooming of a large number of engineering colleges in the country. Despite this, the industry complains of an absence of trained quality engineers.
There is a need for the industry, government and academia to formulate a strategy for engineering and science education in India. There needs to be a high-level think tank that reviews the higher engineering and science education system in India and provides direction for future growth. It is important to understand the actual trends in numbers, placements, salaries, employability, research output and compare and benchmark performance with other institutions. An understanding of the reality should form the basis of policy changes that ensure that the engineering education system meets the changing needs of the industry and society.

Gupta and Gupta (2011) in their paper "Higher Education in India: Structure, Statistics and Challenges" enlightened that India's education system is often cited as one of the main contributors to the economic rise of India. The size of India's higher education market is about $40 billion per year. Presently about 12.4 percent of students go for higher education from the country. If India were to increase that figure of 12.4% to 30%, then it would need another 800 to one thousand universities and over 40,000 colleges in the next 10 years. The authors present the development and present scenario of higher education in India by analyzing the various data and also identifies the key challenges that India's higher education sector is facing.

Bhat (2014) says that engineering college libraries attempt to meet the need of a diverse and complex group of users, who have wide ranging interest and complex sets of demands. Over the course of the last decade, very valuable resources of information have become available through the Internet and other electronic database, and libraries are currently playing role very different from that of before. Periodical serials are the bedrock of research activities. Periodicals are best source for up-to-date information in a particular field. They are publications which are issued at regular interval, such as journals, magazines and newspapers. They are also often referred to as serials. So researchers want to know the use, purpose and utilization of the periodicals by the users.

Lynne Heslop (2014) in a report titled "Understanding India: The future of higher education and opportunities for international cooperation" said that India's education system, as one of the world's largest, has been studied and reflected on through academic papers, used as a case study and been the subject of many renowned books. Its timing is
critical, given that traditional Indian student mobility patterns have changed, that the UK faces new competition in research cooperation and as gaps are widening between industry demands and higher education provision. In addition, the national elections in India this year, and in the UK in 2015, are likely to provide many policy changes to navigate through. India’s demographic trend means it will soon overtake China as the world’s largest population, and with an average GDP annual growth of 8% over the last decade, its middle classes that demand higher education will swell to over 500 million people in the next ten years. India’s higher education system, originally designed to serve the elite, will now have to serve the people. Innovation and change are required and understanding that change will be essential. This report not only takes a look at what is coming next in India but makes informed recommendations in areas for collaboration.

Pathak (2014) in his article “Adopting MOOCs For Quality Engineering Education In India” proposed a blended MOOCs model for adoption in India. It envisages acceptance of MOOC grades by a university towards its degrees. It also stipulates an important role for local teachers, who will use a ‘flipped class-room’ model of teaching. They will conduct group discussions and problem solving sessions rather than mere lecturing; and locally give and evaluate assignments of which the marks will be factored in the final grade. They will also conduct laboratories where needed. They will thus mentor and guide students, under their charge.

Buke, Tondare and Panchal (2015) through their study “Engineering Education in India: Ethics and Stakeholders Perspective” say that rapid and drastic changes in economic growth are creating higher demands for technical educations especially in engineering educations. Engineering education faces significant challenges as it seeks to meet the demands on engineering profession in the 21st century as unemployment, research work and social aspects. To meet these changes & continuous demands i.e. from industry or society, engineering institutes have to upgrade themselves on a continuous basis with quality of education that can prepare students to face and overcome these challenges. The paper presents a review on engineering education and discussion on different stakeholders such as regulators, Management, students, faculty with their expectations, key roles in the development of institute and the students. How all these stakeholders could involve
making engineering education more interesting and entrepreneur oriented has also presented. However to comb up with the current technologies, industrial and social needs, engineering students has to ethical where the importance of engineering education with ethical values increases.

**Sub-theme 2: Availability of Web Based resources for engineering community**

Miller (2000) in his article titled “Electronic Resources and Academic Libraries, 1980-2000: Historical Perspective” described how collection is to be developed in an electronic environment. Over the past twenty years, academic collection development specialists have dealt with dramatic changes, brought about by decreasing purchasing power and the growing importance of electronic resources. The collection managers have rethought their efforts and revised criteria for the selection of materials in new formats while also maintaining traditional collections.

Linda (2000) said much has been written on issues pertaining to licensing and archiving of digital information. Until recently, there has not been enough information to evaluate how these digital products, particularly journals, are being used. Furthermore, meaningful data are often difficult to obtain as some publishers and vendors supply little or no data or only information they feel supports the purchase of their products. As it becomes increasingly difficult to afford all digital content, librarians must be able to measure digital use of e-journals and books in order to make the best purchasing decisions for their institutions. Librarians must develop their own solutions as well as solutions in collaboration with publishers so that better evaluation of digital content use can occur.

Keller (2000) revealed through his article “Electronic journals: a Delphi survey” revealed that presents the results of a Delphi survey on the future development of electronic journals. The international expert panel comprised 45 scientists, publishers, librarians, journal agents and consultants. The survey covered five areas of interest regarding electronic journals: (1) the future role of scholarly journal literature, (2) scenarios for the journal of the future, (3) the serials crisis and the electronic journal, (4) archiving of electronic journals, and (5) new pricing and access models.

Nabe (2001) in his study on “E-Journal Bundling and Its Impact on Academic Libraries: Some Early Results” discussed about Electronic journal packages, or bundles, have
become standard resources in academic libraries in just the last few years. The impact on collections and budgets will be significant, but are largely yet unmeasured. A survey was designed to begin to provide some data concerning the financial and collection implications of these bundles, and was distributed to the fourteen academic libraries within the Boston Library Consortium. Results are presented and discussed.

Alpi (2001) tried to analyse through her study on “Science & Technology Resources on the Internet; What You See Is What You Get: Science Images on the Web” about selection of image-rich web sites in a variety of scientific disciplines is offered as a starting point for reference questions and educational programs. Tools for keeping up with new image resources are introduced. This review does not cover searching general World Wide Web sites or general commercial image databases for science images.

Dilevko (2002) examined the use of print resources by undergraduate students at the University of Toronto in relation to their use of online resources by using an online survey. Print books were viewed as vital because they provide needed contextual, theoretical, and conceptual information for understanding a given topic. They helped to generate ideas that led to further investigation, and offered balanced analyses of a wide range of issues. Furthermore, use of print books was typically associated with the production of high-quality work, whereas use of online sources was invariable associated with the need to just get things done quickly and easily.

Llewellyn, Pellack & Shonrock (2002) performed a study on “The Use of Electronic-Only Journals in Scientific Research”. According to them Journals that are published exclusively in electronic format present an innovation in the way that scientific information is communicated to the research community. Significant concerns remain regarding the impermanence of materials in electronic formats and the use of innovative features of electronically formatted material. It has taken some time for the e-only journals to become integrated into scientific information systems, indexed by major services, appear in library catalogs, or cited by other researchers. This article surveys the current place of the e-only journal within the information system.

Kelly (2003) made an endeavor to identify awareness and use of e-resources and perceived needs for physical libraries, delivery materials, instructional and promotional services,
resources and technologies. The findings showed that the national trends demonstrate that nontraditional, predominantly part time student uses patterns have been changed and they favored the use of e-resources particularly the Internet. The library efforts were reaching online students and the students were aware of the library resources and use it for their research or project work.

Bilawar (2004) studied the impact of communication technology on libraries and information services. The author focused on digital library concept and compared the traditional to modern library. The speed of IT revolution is in top gear, during the decade, and makes the library to a global library system to operate it at our finger tips. It serves as vehicle for future development. Finally the paper concluded with many advantages of the communication technology with respect to library requirements.

Hyldegaard and Seiden (2004) in their article presented the results of a user evaluation study exploring the usefulness of personalized access to scholarly journals and services with regard to the information behaviour of scientists. The aim was to investigate what factors would be critical to personalization, what personalization features would be relevant and to what extent profile and behaviour based personalization would be acceptable. Three providers of personalized access to scholarly journals and services formed the basis of the study. The user group was fourteen doctoral students. Personalization was found to be associated with expectations of increased efficiency compared to traditional searching, emphasizing the need for functionality oriented features such as search alerts. Profile based personalization was to some extent positively associated with reduction of information overload. Various quality indicators were found to affect the perceived reliability of a service, making trust a critical theme when establishing a personalized user experience. The study suggests implications for the digital library when designing for a personalized information environment.

Pawar (2005) tried to discuss a new internet based education system called e-learning. He assured by his study that internet has become more popular media in India and can be used such an excellent media for high quality education. The study shows the advantages of e-learning like: It saves money, it anytime anywhere service, it increases the productivity, instant feedback etc. The study concludes that e-learning means of becoming literate,
involving new mechanisms for communication, computer networks, multimedia, electronic libraries, distance learning and web enabled classroom. It is characterized by ‘anytime anyplace’ education.

The study of Appleton (2005) illustrated the experience of both academic and support staff in the use of electronic books within a higher education setting. The case studies reported upon practice at Edge Hill College of Higher Education, which had allowed for successful e-book development strategies. The user evaluations provided qualitative analytic data into benefits and disadvantages of using e-books in higher education teaching and learning activity. The speed of access to books is acceptable by maximum users. Overall, ninety percent (90%) of the respondents were positive towards the use of e-books.

According to Corrado (2005) the open access, open source software, and open standards concepts have been garnering increased attention in the field of librarianship and elsewhere. Open access, open source software, and open standards are three concepts that have been receiving increased attention lately in the library world. Open access is seen by some as a possible solution to the increasing price of serials and as a way for governmental funding agencies to receive a better return on investment. Open source software can benefit libraries by lowering initial and ongoing costs, eliminating vendor lock-in, and allowing for greater flexibility. Open standards allow for interoperability to exist between diverse library resources and eases data migration between systems. All three of these concepts are important to libraries individually and they can be even more beneficial when they are leveraged simultaneously. These concepts and their benefits and importance to libraries are examined. Benefits include lower costs, greater accessibility, and better prospects for long-term preservation of scholarly works.

Tonta. and Unal (2006) examined the impact of electronic journals document delivery services. They observed that web sites are gradually changing the old collection management policies of the libraries. Libraries are no longer limited with the “one source one user” model. Taking Turkish national document delivery services as an example. They reported that the success rate was 71% due to digital collection.

Lubans (2007) conducted a study on the use and perceptions of the Web by 235 freshmen. This study included the students’ perceptions of the interrelationship between the Web and
the library. The results showed that respondents were generally cautious about the information they found, with only four in ten respondents rated the Web high for accuracy, while only twenty four percent (24%) rated it high on authority. The majority also said it did not affect their grades. Over one-half, however, said it helped them use their time more efficiently.

The study of Saravanan and Mary (2007) was aimed to know about the college teachers approach to internet and online information resources and their quality consciousness considering some key objectives like: to find out the purpose of use, frequency, approaches, search strategy, merits and demerits of internet and online resources. Questionnaire method was adopted. It was found that majority of respondents (sixty three percent) were using simple search strategy, followed by thirty seven percent were using advance search strategy. Google was the most preferred search engine and than Yahoo found second. The most preferred format was PDF and mixed response followed by HTML and Word Format.

A study was carried out by Anwar Islam (2007) in Sambalpur University To examine the current trends of web-based information retrieval, to discover the magnitude of the dependability of researchers on printed materials and to ascertain the extent to which researchers using traditional libraries; About the authentication of web-based information, over half (55 percent) of the respondents were thought that web-based information as authentic. Google was found most popular search engine followed by Yahoo as second.

Kumar and Grover. (2007) studied the electronic journals impact on scholarly communication, users, and libraries and reported that still academics were in the process of adopting this medium. There were variations in the use of electronic journals from discipline to discipline and research scholars shown positive attitudes towards it. Budget allocation and collection development policy had been also influenced.

**Sub-theme 3: Use of Web Based resources by engineering college libraries**

Liew (2000) surveyed eighty three graduate students at Nanyang Technology University of Singapore on their use and perceptions of electronic journals. The survey showed that a vast majority of graduate students (73%) preferred electronic journals over twenty seven
print journals. This was because electronic journals provided links to additional resources, searching capability, currency, availability and ease of access.

The study of Osorio (2001) on "Web Sites of Science-Engineering Libraries: An Analysis of Content and Design" had examined the design features and content elements of home pages at 45 science-engineering libraries. The results show that these home pages have many of the elements found in other academic home pages; it was also found that they have the problems and limitations typically found in similar home pages. It is not intended to be an evaluation instrument of web sites but rather a tool to create the fingerprints of typical science engineering web sites.

According to Bracke & Critz (2001), library instruction for engineering students needs 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 key to the success of library instruction for engineering students.

Arnold and others (2003) studied on "Hands-on Learning for Freshman Engineering Students" and said that Formal library orientation sessions for freshman engineering students have been offered for more than seven years by librarians in the Engineering and Physical Sciences Library (EPSL), University of Maryland. Approximately 800 students per year attend these sessions. The sessions are conducted in the library and are required by all students enrolled in ENES 100 (Introduction to Engineering Design). In the spring of 2001 the orientation sessions were reformatted based on comments contained in short surveys completed by students at the end of each session. The format was changed from completely lecture-based to a more interactive session entitled "EPSL Expedition."

Franklin & Plum (2004) in their paper "Library usage patterns in the electronic information environment" examined the methodology and results from Web-based surveys of more than 15,000 networked electronic services users in the United States between July 1998 and June 2003 at four academic health sciences libraries and two large main campus libraries serving a variety of disciplines. A. statistically valid methodology for administering simultaneous Web-based and print-based surveys using the random moments sampling technique is discussed and implemented. Results from the Web-based surveys showed that at the four academic health sciences libraries, there were
approximately four remote networked electronic services users for each in-house user. This ratio was even higher for faculty, staff, and research fellows at the academic health sciences libraries, where more than five remote users for each in-house user were recorded. The purpose of use for networked electronic resources by patrons within the library is different from the purpose of use of those resources by patrons using the resources remotely. The implications of these results on how librarians reach decisions about networked electronic resources and services are discussed.

The aim of the study of Rajeev Kumar (2005) was to analyze the use of internet and related issues among the teachers and students of Engineering College of Punjab. The study demonstrated the various aspects of internet use, purpose of internet use, ways to browse the information from the internet, problems faced by the users and satisfaction level of users with the facilities provided in the colleges. The result of the survey also provided information about the benefits of the internet over conventional documents. The most common problem was the slow internet access speed. More than one third of the respondents felt that internet has improved their professional competence.

Mounissamy (2006) confined to identify the promotional ways adopted by seven IITs and eighteen NITs for the effective use of e-resources including institute’s and library’s home pages and their functionalities for accessing the electronic resources. The descriptive research design was used and comprehensive sampling method was adopted as the mode of study. The library web pages of IITs’ and NITs’ were seemed to be playing good role in promoting the electronic resources among the students and faculty members.

The primary aim of the study of Doraswamy (2006) was to know the use of digital resources and services by M.Tech. students of Koneru Lakshmaiah College of Engineering. Most of the users were satisfied with e-mail service as compared to the other digital resources and services. ‘Google’ was found most popular search engine. Lack of training, lack of time and limited access facilities were few problems indicated by the users.

Jange and Sami (2006) attempted to promote and optimize the use of the internet as an information sources among engineering faculties and research scholars of National Institute of Technology (NITs) in India. A total of 850 questionnaires and interview
schedules were distributed to the faculty and research scholars of NITs in India, 665 questionnaires were duly obtained with a response rate of 78.24%. An attempt has been made to develop instruments of acceptance of internet technology known as Technology Acceptance Model (TAM) among 75 faculty and research scholars of NITs in India using the original constructs. Using several parameters, authors came out with a mathematical regression model in which the result of regression analysis show that the four variables such as age, teaching and research experience and level of satisfaction put together explain 39% of variance invariable use of Internet.

Duke and others (2006) studied on “Reaching the Engineering and Science Communities: New Technologies and Approaches at MIT” and discussed various approaches and technologies that the Massachusetts Institute of Technology Engineering and Science Libraries are employing to educate our users about the resources and services available to them. They also said that outreach and promotion of library resources and services is an increasing challenge in the online world since many of our users do not often visit the library. This is particularly true in science and engineering libraries, where much of our content is available online and our users tend to be technologically savvy. We need to find new ways to reach our communities and draw them back into the library, both physically and virtually.

The main purpose of the study of Madhusudhan (2007) was to find out the current trends in information search through internet and problems while searching internet information by the research scholars. The study was conducted on a sample of fifty one research scholars of Central Science Library at Delhi University.

The study of Kumbar (2007) aimed at the internet use and its impact among the engineering colleges of Mysore, Hasan and Mandya districts. The number of colleges covered under the study was seven as: four in Mysore, two in Hasan and one in Mandya. The Purpose of the use of internet, frequency of the internet, satisfaction level of users, problems regarding internet etc. were the key objectives of the study.

The main objective of the study of Ansari (2008) was to analyze all aspects related to internet use by the students of the Delhi University. It included gender ratio of internet users, level of use of internet services, purpose of use of internet services, most favorite
search engines, problems of internet services and the views of the students regarding the replacement of library by the internet etc. The most critical problem identified by a large majority was 'slow speed'. They were also requested to compare internet resources with conventional documents. A significant majority of users indicated that internet was more informative, less expensive and time saving in comparison to conventional documents.

The study of Madhusudhan (2008) focused on the use of UGC-Infonet e-journals by research scholars and students. The main aim was to identify the needs and requirements of users in general and to know the use of UGC-Infonet Library and Information Science e-journals in the University of Delhi by research scholars and students of Library and Information Science in particular. Sixty seven percent (67%) respondents faced with slow internet connectivity, fifty two percent (52%) found difficulty in systems' speed, and forty two percent (42%) reported lack of time and training. Forty percent (40%) respondents were satisfied and gave positive opinion about the UGC-Infonet e-journals Consortium by rating 'very good', followed by thirty seven percent (37%) who rated 'good', twelve percent (12%) rated as 'excellent' and remaining nine percent eleven percent (11%) rated the consortium as 'fair'.

The survey of Kindilchie (2008) identifies trends among faculty members at Qatar University in utilizing electronic information resources to develop their teaching, research and personal knowledge. In addition the study also sought to establish the effectiveness of using information, especially from electronic sources. Almost all faculty members acknowledged using internet-based e-resources and services for personal purpose, their use of electronic databases to fulfill their professional information needs in teaching and research appeared more limited.

Rao and Babu (2008) found that more than three fourth respondents were visiting libraries for research studies and to write research papers, while a few users used e-resources in autonomous college libraries in Chennai. Authors suggested for the right choice between print and electronic sources of information for collection development, Internet based services and resource sharing.

Yu and Breivold (2008) in the book “Electronic resource management in libraries : research and practice” provides comprehensive coverage of the issues, methods, theories,
and challenges connected with the provision of electronic resources in libraries, with emphasis on strategic planning, operational guidelines, and practices. Its primary focus is management practices of the life-cycle of commercially acquired electronic resources from selection and ordering to cataloging, Web presentation, user support, usage evaluation, and more.

Sujatha and Mudhol (2008) have depicted in their study that in the college of fisheries, 88.9% users used electronic information sources for thesis/project work and 87.6% were using for ongoing research work. Majority of the respondents comprising of 79.0% browsed the Internet for subject specific information websites and 75.3% for international/regional institution websites. E-mail was judged as the most frequently used electronic information source followed by web resources.

A survey was conducted by Chowdappa (2009) on the academic users in Mysore to collect users’ opinion on the use of digital sources, to find out users’ opinion on the future needs of e-journals, to find out the extent of reliance on internet for various purpose. Quite a good percentage of users also relied upon internet for the purpose of relay chatting and accessing bibliographic databases. A moderate percentage of users were dependent for accessing yellow pages, directories and discussion forums. The important finding of the study was that the information users of higher education in Mysore city heavily relied upon conventional books and journals on one hand, and digital resources, especially internet and CDs on the other.

The study of Kumbar (2009) dealt with the usage of UGC-Infonet e-journals consortium by faculty members and research scholars of Karnataka University. It was observed that a majority (93% faculty and 95%, researchers) were well aware of the consortium programme. Some respondents indicated that the contents of consortia were better than print version. Maximum respondents felt that more journals should be included in consortia portal. Few users felt the necessity for training/awareness programme for consortia based services.

The study of Singh (2009) attempted to find out the usage of e-resources of various publishers available under UGC-INFONET by the academic community of Manipur University. The study revealed that while there was an increase in the usage of the e-
resources of most of the publishers' in-spite of certain problems of accessibility, resources of some of the publishers were underutilized. Overall the study concluded that using the UCG-INFONET, lots of electronic resources were being used by the users of Manipur University Library users in different manner and different purpose.

An attempt has been made Jange, Suresh (2014) to study the use of the Internet as an Information Source among engineering faculty and Research Scholars and the impact of Internet technology on Libraries of National Institutes of Technology in India to enhance the optimization of rich information resources and services on the net to the academic and research pursuit of netizens. The nature of the research study, keeping in view the population to be covered, their characteristics and the technology employed, has necessitated a multi-methodological strategy to collect and analyze the data by using survey research methods which includes Questionnaire, Interview and Observation, as a means to elicit information pertaining to this study. A total of 850 questionnaires and Interview Schedules were distributed to the faculty and research scholars, 665 questionnaires were duly obtained with a response rate of 78.24%. Further, a total of 17 questionnaires were distributed to the Librarians of Regional Engineering Colleges in India, out of which 10 were duly obtained, with a feedback of 58.82%. The most popular perception of Internet technology is 'Wealth of huge useful current information and E-mail service and World Wide Web (WWW) are the most frequently used Internet services among the engineering community and opined fairly better satisfaction with the current state of Internet to support in their academic and research activities. The research study encompasses independent variables mainly Designation, Age, Qualification, Teaching and Research Experience and Formal Training of respondents. In this paper, efforts were made to examine the relationship between the variables Use of Internet (UOI) and Level of Satisfaction (LOS), as a two major dependent variables of the research study.

The paper “Will open-access journals substitute big-deal subscriptions in engineering college libraries in India?” by Nagaraja and Vasanathkumar (2014) aims to analyse the impact of open-access (OA) journals in engineering and technology institutions, if libraries are not subscribed to the journals through the All India Council for Technical Education (AICTE) mandatory packages. In India, many engineering colleges do not subscribe to
journals through business subscription models or consortia and invariably a majority of them depend on OA journals to fulfil their users' needs. The authors identify the impact factors of mandatory journals made in big-deal subscriptions with the impact factors of OA journals available to access in Directory of OA Journals pertaining to engineering and technology. The study reveals that journals subscribed through big-deal subscriptions have better impact in the scholarly communications than the OA journals.

Choudhury (2015) explains that due to crunching financial assistance and explosion of information resources, it is not possible to serve all information in printed form by academic libraries. But the main goal of any library is to meet the requirement of users at right time, in right place, at right price and in right format. Therefore the e-resources play a vital role to fulfill this goal. The main objective of this study is to know how the e-resources are using by the students and teachers of engineering college (Both Private and Government) of Assam, and to know what are the problems they faced by using e-resources. This study will help others to solve the problems and take benefits of e-resources. The data are collected from four government and two private engineering colleges of Assam. In compare with private engineering has better infrastructure then the government engineering college, but still users of e-resources from government engineering college are very encouraging.

Sinha and Deb (2015) in their paper “Usage of E-Resources available under INDEST-AICTE consortium by library users of NIT, Silchar, Assam” conducted a study on NIT Library Users which comprises of faculty members, Research Scholars, UG and PG Students perusing Engineering and Management Courses. The study comprises of administration of questionnaires to the participants for knowing their skills in accessing information/e-resources for their academic and research. The data collected from the administered questionnaire were analysed, tabulated and represented in graphical form using Microsoft Excel. The study shows that most of the respondents are aware of the INDEST-Consortium and are using e-resources, mainly the e-journals, frequently for seeking information. While analyzing data, it has been found that maximum users are using equally printed and electronic resources for their academic purposes. It is interesting to note that majority of users under study prefer e-resources while only a few of them
prefer printed resources. Majority of respondents have suggested that the authority should provide adequate Internet Terminals with high speed of bandwidth for optimum utilisation of e-resources available under INDEST-AICTE Consortia.

In reviewing literature on the use of electronic resources, it was found that electronic resources, especially electronic journals and internet have been widely adopted in the library. Library collections are no longer limited to those collection that housed in the building, but also collections that are leased or access such as online databases. To make the library resources accessible to the users, libraries have begun to build library web-site to link all these subscribed databases and also quality electronic resources that available free over the Internet. To facilitate users to search the vast array of information resources, Web-based OPAC, (Online Access Public Catalogue) has been available through library web-site. Users are now not only access to the free information in the Internet, but also those valuable and subscribed resources from the library as well as print resources that purchased by the library. However, users (especially younger ones) have developed a clear preference for receiving information in electronic format.

As we pointed out the whole literature reviewed about “use of web based-resources”, we find that a large number of electronic resources are available for different purpose but Internet and e-journals are most popular e-resources among the academics, research scholars and students. Maximum studies have been carried out on the use of Internet, e-journals, consortia services. Usage of electronic databases, Web OPAC, e-books are also popular but these are not used as frequently as Internet and e-journals are used. The reviewed studies related to Indian community show that use and usability of electronic resources have become more popular and day by day the use of e-resources are increasing among academic community of India. Consortia based services, e-journals, internet, e-books etc. are now frequently available and these are being used by teachers, research scholars and students of various disciplines. No doubt the importance of printed materials is unique but e-resources provide a step ahead to boost up the knowledge gaining process.