CHAPTER 2

REVIEW OF LITERATURE
2. Introduction

The present study focused on the role ICT in Pharm ICLs of Iran universities. Literature does not indicate any directly related studies in the same scope of the present study; however, in the area of ICLs and the role of ICT in their services and productivity some studies have been carried out. The literature related to ICLs and ICT deals with the effective role of ICLs in academic contexts and accounts for the type of facilities and the kind of services that ICT has provided for ICLs, librarians and ICLs users. Research studies covering these aspects have been reviewed as indirectly related studies connected to ICT in Pharm ICLs through this chapter. Review of related literature has been conducted from various sources i.e. journals, books, papers, review of articles, PhD and master dissertations, reports, etc. This chapter is divided into two parts: International scenario, including review of related literature out of Iran and National scenario, including review of related literature in Iran.

2.1. International Scenario

A number of studies have investigated the value and contribution of ICL, information professionals and information content to the development of academic organization and promotion of knowledge in all fields of science. Academic organizations require an ongoing practice of implementation and advancement of ICT to sustain their position in the world of competition. The more services and facilities of ICT available in ICLs, the better education and research occurs in academic organizations. Literature in ICLs starts with studies on information needs analysis and finding out about the ways to access the required information. In the same field, Voigt (212, 1959) conducted a study on "The Researcher and his Sources of Scientific Information" to find out how scientists access information in university ICLs. The researcher divided scientists' information needs into three categories: the need to keep up to date, or the ‘current approach’; the need for specific information, or the ‘everyday’ approach; and the need for all relevant information, or the ‘exhaustive approach’. The researcher found out that in line with previous literature (Van Styvendaele (208, 1977); Franklin (57, 1982); Rowland
(153, 1982)) the favored method of obtaining information was scanning the current issues of important journals. The findings support Blaxter and Blaxter’s (22, 1973) study carried out on biologists. The subjects of their study indicated that they read a median of 12 ‘journals’ to keep current; some of them also indicated the importance of ‘review and abstracting publications’. Consulting ‘Current Contents’ and their own ‘colleagues’ were also important to some of them. However, they started a new research through references listed at the end of primary papers.

Turoff and Hiltz (204, 1982) conducted a research on “The Electronic Journal: A Progress Report”. They mentioned that electronic journals in their non-experimental form did not begin until the 1990s, although electronic journals have been under development since 1976. Keyhani (86, 1993) in another study considered electronic journals. He attempted to find out about the status of electronic journals in academic libraries of health science. The findings indicated that the first peer-reviewed, full-text electronic journal, including graphics was the Online Journal of Current Clinical Trials which was in access in the centers under study.

Hurych (71, 1986) studied the pattern of use of online sources by scientists in different fields of Science, Social Science and Humanities in "After Bath: Scientists, Social Scientists and the Humanists in the Context of Online Searching". The results indicated that scientists' frequency of use of online services was less than that of the social scientists, 55.2% compared to 11.5%. In this study, the medical professions, including nursing and allied health, were considered as a separate category that were ranked as slightly heavier users (18.8%). The reason was thought to be the fact that these academics had been used to accessing the MEDLINE database from the National Library of Medicine for a number of years and since they made frequent use of indexing and abstracting services, the transition from manual to online searching was a natural progression. When the number of search requests was analyzed discipline wise, it was found that only 23.2% came from the science faculty out of which most were concerned with chemistry and the
biological sciences. These fields used highly developed indexing and abstracting services such as Chemical Abstracts, Biological Abstracts and Index Medicus. The researcher believes that scientists using these tools become quickly interested in online searching of the databases and once started, use them repeatedly and effectively.

Eisenberg (47, 1988) conducted a study on “The Online Journal of Current Clinical Trials: An Innovation in Electronic Journal Publishing”. He explained the advantages of electronic journals. They gave instant access to the primary literature and provided convenient access from personal workstations. Furthermore, there were the advantages of full-text searching, retrieval capabilities that went well beyond those found in abstracting and indexing publications. Electronic journals eliminated backlogs once the review process passed. It has been the goal of the Online Journal of Current Clinical Trials to issue the article online and available in 48 hours after it passes the review cycle. Other advantages include: the ease of the electronic format when revision is needed; the opportunity for a writer to make public something on a provisional basis before publishing; and the possibility for author and reader to make correspondence directly.

Moran (122, 1989) carried out a research on “The Unintended Revolution in Academic Libraries: 1939 - 1989 and Beyond”. She stated that when computer technology first crept into library operations, the library was often the first academic unit on campus to implement computer systems. These were concentrated in technical services and out of the sight of most patrons and it was not until the 1980s that OPACs provided library patrons with their first confrontation with library technology which forced them to change their traditional methods of seeking information. Since that time, many new tools have linked people to information and the impact this made on the learning environment and the process of scholarly communication has been significant.

Osburn (130, 1989) in his research entitled “The Structuring of the Scholarly Communication System” mentions that what the computer has made possible is the
performance of many functions simultaneously and at great speed, the compacting of vast stores of information into manageable formats, the facile manipulation and modification of that information and the inter-connectability and correlation of different sets of information. When we think of information as communication, we see why the advent of the computer is such a landmark in the history of scholarly communication: it tightened the system by intensifying the immediacy of the influence of each agent upon the others. Mechanization of libraries and library services have been made possible by the utilization of computers and other electronic devices. Computers are considered to be very vital in this process since they have a lot of capabilities and potentials.

Frye (58, 1990) did a research under the title of "The Future of the Library: A View from the Provost's Office". He aimed at explaining the changing role of computers. He believes that there has to be a change from an emphasis on building the largest collection of published and archival material to an emphasis on making accessible the greatest amount of information, wherever it is located and in whatever format. The primary goal for the library 'must shift from maximum ownership of material to maximum access to materials'. Frye gives three reasons for this change: costs, technology and intellectual need. There has been the initial cost of items, life cycle costs associated with the constant maintenance and process of collections. Technology is considered as providing the opportunity, the means for change and the continuing motivation as a competitive information market developed. Frye's ideas on technology has been supported by Michalak (cited by Arms and Thomas, 8, 1988), who states, 'technology is changing the ways in which we access information, resulting in an increased demand and need for information'. Frye's final analysis of intellectual need is based on the need to do better what the library has been established for in the first place that is making the resources accessible to the readers.

Lyman (102, 1991) conducted a research on "The Emerging Electronic Library". He states that 'the volume of scholarly information is increasing faster than
the ability of researchers to manage it, publishers to print it, libraries to collect it and scholars to read it'. Therefore, there has been a great demand for systems that can cope with the rapid diffusion of information which in turn could meet the needs of various users. The other reason for the growth of ICT in ICLs has been mentioned to be the shortage of budget libraries faced due to the huge amount of academic journals they subscribed to. In 1992, it was reported that American research libraries were being 'systematically depopulated of current subscriptions to scholarly journals' and this had become a significant problem for those academic libraries collecting in the areas of science, engineering and medicine (Cummings et al, 38, 1992). This trend has not been confined to the United States. The 1993 Annual Report of the ANU library system (The Library Annual Report, 97, 1993) notes that in 1992 the continued high price of serials, particularly science serials, has resulted in the cancellation of standing orders to the value of $270 000, after having previously used up a reserve of $250 000. No library could maintain this level of expenditure. Thus, computers and ICT can solve the problem by saving money, time and energy in transferring, storing and retrieval of required information.

Weaver and Porter (213, 1991) studied the role of computerized information storage and retrieval techniques in the work of the Medical Information Department, ICI Pharmaceuticals Group. The results indicated that there were some improvements due to the use of optical disc information storage and retrieval systems. These systems were supported by FileNet (document image processing system) hardware and SAS software run on an IBM mainframe.

Arms (7, 1992) in his paper entitled “Scholarly Publishing on the National Networks” predicted about the future of libraries. He mentions, “Some day in the future a scholar may be better served by sitting at a personal computer connected to a communications network than by making a visit to a library” (p.158). The situation he explained is something quite feasible today by information technology injected to the libraries. He has expressed his views about the probable changes in the libraries. He states that some scholars do not consider this scenario desirable
and also these changes may not be technically, economically or legally possible. Now, we see that it is feasible to have computers and networks in the libraries and also there is a welcome from the side of scholars, since they can use library's sources to a great extend, anytime and anywhere.

Buckland (26, 1992) attempted to describe the concept of the electronic library in his study. He considered it in terms of Lancaster's (95, 1978) idea of the 'paperless library' specified through features such as stored documents that could be used in electronic, or similar machine-readable form rather than on paper or other localized media. Documents in electronic forms have the characteristics of: not being localized, the same database being used by multiple users at the same time, being easily copied, being flexible and having the capability of being rearranged, reformatted and combined with other documents and finally being less bulky than paper documents.

Meadows and Bukhari (112, 1992) carried out a study entitled "The Use of Information Technology by Scientists in British and Saudi Arabian Universities". They compared the use of IT by faculty members and post graduate students in British and Saudi Arabian Universities in three departments of Chemistry, Biology and Engineering. The data were collected through a questionnaire. The results showed that there were a rapid growth and diversification of information technology activities in the British Universities. It indicated that British users used online and offline databanks two times more than the Saudi Arabian users. 70.2% of the British users used e-mail while none of the Saudi Arabian used E-mail. Both users of the two countries use word processing, data analysis software and graphics. Half of the users in both countries used IT to seek information, communicate and do research works.

Bop, Mona and Riche (23, 1993) have conducted a research under the title of “The Emergence of System wide Electronic Access to Information Sources: the Experience of two California State University Libraries”. They wanted to find out
how librarians used electronic sources. The results indicated that librarians similar to the other users were reliant to electronic sources to access the information quickly and easily.

**Marghalani and Hafez (108, 1993)** conducted a research on “Online Search Service at the King Abdulaziz University Library, Jeddah, Saudi Arabia”. They studied the awareness of faculty members at (KAAU) towards online search services in the Jeddah main campus. The results showed that 45% of the respondents used online search services to conduct ‘personal searches’. The faculty of engineering made the largest number of requests among others. Considering the subject distribution of online searches, medicines were found to be the most prominent one which searched various topics for conducting studies.

**Tegart (191, 1993)** did a study on “Issues for the Future”. He explained the use of IT in various fields of sciences stating that information technology gradually entered into all fields of research but whereas researchers in the natural sciences and engineering had been familiar with computers and data processing for some time, researchers in the arts, humanities and social sciences did not begin to use them until much later. Despite this penetration of information technology, the number of empirical studies relating to academics’ use of its various facets remained small.

**Cartwright (27, 1994)** conducted a study on “Information Technology; Considerations for Tenure and Promotion”. He maintained that the last few years witnessed an explosion in communications technologies on US college and university campuses, including faxes, cellular telephones, campus networks and modem equipped microcomputers. The article discussed two major related issues: one involved the enthusiasm of many faculty members to use the new technologies, the other issue was the unwillingness of many faculties to become too deeply involved in the actual creation of technology applications because they might not be successful in the long run. The author also considered the faculty who use and
develop technology applications. It offers some 56 cautions to those faculties who used technology as an end rather than as a means and suggested guidelines for tenure and promotion review committees.

**De Loughry (41, 1994)** carried out a research entitled "For the Community of Scholars, Being Connected Takes on a Whole New Meaning". He stated that internet quickly became indispensable for academicians. No one could keep up with the field any other way. The Internet was proved to be at least six months ahead of journals and conferences and certainly ahead of books. It was also suggested (Bourke, 24, 1993) that in some disciplines such as physics, where major practitioners lived in a pre-print world for years in which journals served principally archival functions, the step to electronic publishing had been a short one.

**Schauder (157, 1994)** in his study on "Development of the E-Library Concept, With Special Reference to Australian Libraries" describes the concept of the electronic library as:

... combining an on-site collection of current heavily used materials, in both print and electronic form, with an electronic network which provides access to and delivery from, external sources, library and commercial, worldwide. The design goal for the user is to create the effect of an indefinitely large collection through the electronic access and delivery of materials as needed, rather than by expending staff and acquisition funds in an attempt to anticipate future demands for a wide range of retrospective materials and peripheral publications.

**Bane and Milheim (18, 1995)** did a study entitled "Internet in Sights: How Academics Are Using the Internet". They attempted to find out the quality of internet facilities in academic centers and made comparison with internet outside universities. They found out that the access to the information was quick and easy. There was no rush for getting connected to the network a service which was free of charge. And also there were experts who supervised the network and guided the users. All these advantages not available for the networks outside universities made the academic internet convenient to use.
Khyurik (88, 1995) carried out a survey on “Computing Technology as a Means for the Retrieval of Scientific Medical Information”. The investigator assumed that medical professionals need easy access to a vast amount of medical information and computing technology. The researcher discussed the availability of important medical databases, both online and CD-ROM, with the emphasis on the subject coverage and structure of MEDLINE. This database provided access to Index Medicus which was growing at an annual rate of 250,000 entries and the MEDLINE database that grew to 4.5 million references in 1984.

Mc Dufee (111, 1995) conducted a study entitled “Medical Informatics: Information Connection; Information Technology, the Health Sciences Librarian and the Community-Based Teaching Practice”. The study covered inspecting the changes in the medical school curriculum, health care delivery, computer and network technology which all together drove libraries to adopt new technology-based models of service. Traditional services were to be delivered in new ways with more speed and better quality.

Mehta and Young (115, 1995) studied the faculty staff information needs in a paper. Results indicated that 83% of respondents emphasized that the information included in journals were the main source of information for them. 49% preferred online databases and 42% used CD-ROMs to find the information they needed. It was also indicated that 71% of faculty staff used E-mails for correspondence mainly to share their colleague’s ideas.

Rolinson, Meadows and Smith (151, 1995) carried out a study on “Use of Information Technology by Biological Researchers”. Questionnaires were collected from 254 biology researchers. Results show that there are variations in usage, depending on the institution and special field involved. It appeared that senior researchers were more information active than their junior colleagues, such differences could mostly be explained in terms of the pressures on senior staff time.
Results also indicated that 50% of the researchers used IT for educational purposes and 46% for communicating with other researchers. 87% of the respondents were satisfied with IT. Most of the respondents had PC in their office and also half of them had computer at homes. The respondents mainly used on-disc databanks, online databanks, e-mail, BBS and different software.

**Silva (171, 1995)** conducted a survey on “The Internet and PERUSE: McGill's Health Sciences Information Technology for the Twenty-first Century”. The paper which was presented at the 60th IFLA General Conference discussed the effect of internet services and resources on research and teaching in medical science, presented the PERUSE Project at McGill University Libraries, Quebec Province and the arrival of virtual libraries. It indicated that the CD-ROM database selected by McGill for its PERUSE Project was CD-PLUS, operating under its OVID search software, which allowed access to a number of medical databases, such as MEDLINE, PsycINFO.

**Smith (182, 1995)** conducted a study on “Information Technology into the Twenty First Century: Impact on Health Care”. The researcher studied a wide range of information technology applications which were expected to have a significant impact on medical affairs and health care. The results showed a positive impact of information communication technology in handling the required information to the users.

**Tenopier (196, 1995)** did a very comprehensive study entitled “Authors and Readers: The Keys to Success or Failure for Electronic Publishing”. He aimed at reviewing the literature relating to electronic publishing to account for their positive or negative role in libraries. He concluded that the readers would be convinced if electronic publishing be in access, since it was superior to the traditional print publishing in the cases of speed and convenience. It seems that in the United States electronic publishing have the potential to attract readers.
Case (28, 1996) carried out a study on “Electronic Publishing Explodes on the Web”. He aimed at identifying the current status of electronic journals. The researcher considered the existing journal titles, newsletters and discussion lists. The findings of the study showed that by 1996 the ARL Directory of Electronic Journals, Newsletters and Academic Discussion Lists included 1,093 journal titles, 596 newsletters and 3,118 discussion lists. The study implied that the number of these electronic materials would have an outstanding increase in near future.

Cohn (33, 1996) studied the impact of computer mediated communication on the publication productivity of faculty in association of Jesuit Colleges and universities. The results indicated a positive significance relationship between participants’ use of Internet and electronic information sources and production of publication of subjects of the study. Those who used internet and electronic sources more than others had more publications.

Liebscher and Denman (98, 1996) conducted a study on “Factors that Influence the Use of Electronic Networks by Science and Engineering Faculty at Small Institutions”. They wanted to investigate factors that influence the adoption and use of electronic networks and network services by Science and Engineering faculty in small universities and colleges. The investigators maintained that there was a relationship between users’ perceived expertise and the number of network service used. The majority of network users had been using the services for research and teaching. E-mail, electronic databases, ran programs and file transfer were considered to be most useful for research and e-mail was the most used service among the respondents.

Moyo (125, 1996) conducted a study on “Training Needs for Internet Usage in a Learning Environment: University of Botswana Case” to find out the training needs of Internet users in an academic environment. The investigator came across to the fact that the existing facilities were not used to the most because basic IT skills were lacking among the academic staff. The help provided by computer center
laboratory staff was neither adequate nor effective in assisting staff to learn about the existing facility.

Rezaee Sharifabadi (148, 1996) carried out a research entitled "The Use of Internet by Psychologists in all Australian Schools of Psychology". The research explored the use of the Internet by psychologists in all Australian University Schools of Psychology. In particular, the researcher investigated the effects of the Internet on research activities, general information seeking and communication behavior of psychologists. Data were collected in a four-stage approach, utilizing printed and online questionnaires and an online diary. Results of the study revealed that psychologists used the Internet extensively for their academic activities. They recognized that the Internet was affecting their approach to the research process. The Internet assisted psychologists to keep up-to-date with recent developments in their areas of interest. Many psychologists claimed that they had wider and more frequent communication with colleagues and collaborators which led them to new insights in research. Their research activities were also affected by access to online information systems and on-line databases. Psychologists stated that the increased access to resources, quicker and easier communication with colleagues influenced the quality of their research as well as the quantity of their publications. There were two other types of behavioral changes that emerged in the investigation: the changes in psychologists' use of information sources and changes in information dissemination. Journals were by far the most important source of information and the primary means of formal communication among academics under investigation, however, many psychologists stated that they used e-mail and electronic discussion groups in keeping up to date. They also used newer Internet services such as World Wide Web. Electronic publishing of articles via the Internet, especially posting their articles to web sites, was also a growing practice among psychologists. Many psychologists also used the Internet for circulation of preprints, submission of papers to publishers and conferences, requesting reprints from other authors, sending requested reprints, reviewing manuscripts sent by publishers and editing manuscripts sent via the Internet by other people.
Cogdill (34, 1997) investigated medical students’ information needs and resource selection. It was indicated that the information medical students need were relevant to diagnosis, treatment and disease. The most frequently identified resources were MEDLINE and textbooks. Results of the study proposed that librarians serving the information needs of medical students could not overlook the importance of textbooks which were increasingly available in both print and electronic formats. Hurd and Weller (70, 1997) also noted a shift to online databases by chemists when the databases became available through the network at no charge to users.

Kahan (83, 1997) surveyed the attitude of East Tennessee medical librarians about evolving computer information technology. The researcher interviewed 9 medical librarians (8 of whom were administrative directors) to show their attitudes to the ongoing evolution of technology. The survey studied training for software and CD-ROMs; training for online services; personal and institutional commitment to technology and training; time spent on learning computer programs; and librarians’ opinions about adapting to new computer technologies.

Liebscher, Abels and Denman (99, 1997) carried out a research on “Factors that Influence the Use of Electronic Networks by Science and Engineering Faculty at Small Institutions”. They attempted to find the factors that were responsible for the use of internet by teachers of science and engineering in small institutions. The results showed that majority of users (81%) used the internet for the purpose of e-mail services.

Mendes and Meadows (118, 1997) carried out a comparative study on personal information acquisition by health professionals in Brazilian and British hospitals. They investigated the ways in which four groups of health professionals (consultants, junior medical staff, nurses and administrators) working in three hospitals in Brazil and the UK, used ICLs. The study revealed that the information
activities of health professionals in Brazil and the UK followed a similar pattern. UK health professionals obviously had better access to publications than their Brazilian counterparts, because Brazilians had the problems of: not having foreign publications, the language barrier, poor access to electronic information sources and greater difficulty in attending conferences.

Tellis (195, 1997) conducted a research entitled “Information Technology in a University: A Case Study”. The researcher did a case study at Fairfield University, USA, on the rapid increase in Information Technology implementation. The study was a replication of Levy’s work. The investigator extended it by examining aspects of the Internet, World Wide Web and client/server computing. Survey instruments were the primary means of data collection, improved by interviews and internal documents. The results indicated that there were potentially large increases in expenditure as users felt the need to use the new technology. Recommendations account for more formal server capacity planning and configuration and shorter Information Technology planning cycles. Through data analysis, interviews and literature the investigator have provided a series of conclusions. Institutional planning for Information Technology is not adequate. Reduction in the workforce due to improved productivity could equalize concern over the cost of Information Technology. A shorter planning cycle is needed for Information Technology. Allocation of resources is inequitable among users. Users are not satisfied with their ability to influence computing decisions. Faculty and administrators reject any potential sources of funding for Information Technology. Faculty and administrators felt that computing improved the scope of their work. They have differing views on the level of computing resources at the institution. The expenditures and procedures for completion of client/server computing were not conducted in a systematic and documented manner. The procedures of acquiring equipment do not meet users needs in terms of either pricing or timeliness. Maintenance service of equipment is inadequate. Maintenance responsibilities assigned to agencies are not clear to users. There is a low level of user confidence in network integrity. The faculty likes to use networked PCs in the classrooms. User productivity is lowered because of
resource allocation problems and other technology issues. It is predicted that there will be a significant increase in the use of the Internet and WWW by faculty over the next five years. Therefore, the requirements of Internet and WWW need to be accounted for by a well-designed client/server environment. There is no formal procedure to organize the servers using capacity planning procedures. Multimedia classrooms for teaching and support will be required in the near future.

Mook Oh and Meadows (121, 1998) carried out a study on “The Usage of Information Technology in South Korean Universities”. Data was collected through questionnaires sent to all academic staff, research students and research assistants in six selected universities. Interviews were arranged with the staffs from computer centre and the library of each university and also with academic staff who were concerned with departmental computing. The researchers were divided the under study universities into three groups (A, B and C) based on the level of their electronic networking knowledge and activities. The results of the study indicated that majority (70%) had less than ten year’s experience of using computers. Considering the subject background, engineers made more use of Information Technology than scientists and also there were variations between the engineering groups. 86% of respondents in group A, 50% in group B and 26% in group C universities had access to computing facilities such as: data collection, statistical analysis, graphical display, word processing, personal database, electronic mail, bulletin board, file transfer, telnet, OPAC, CD-ROM search, campus database, nationwide database and international databases.

Powell’s (134, 1998) study on “Utilization Levels and Attitudes Towards Technology in Tennesse School Library Media Centre” indicated that the Internet, e-mail and CD-ROM were the most commonly used means of ICT to access information in Tessnessee’s school media centers, in USA. The mean score of utilization of technology by the respondents was about 7.00. The researcher also found that the access levels and utilization levels were positively through weekly correlated with the respondents’ IT attitudes. It was indicated that respondents had
less to do with the provision of the technology and more to do with the way it was utilized or made available for utilization.

Rozik and Pogacnik (152, 1998) surveyed the “Impact of the IT on the Role of Medical Libraries in Information Management”. They maintain that the rapid growth of biomedical knowledge and IT development is changing the infrastructure of health care systems, education and research. The roles of medical libraries have therefore shifted from managing containers of information towards influencing biomedical information resource content and education through quick and efficient access to the sources. These responsibilities have been formalized in American standards for medical libraries, stressing the information activities for advances in medicine. The problem is the lack of specific guidelines for practical action, inadequate legal framework and inadequate funding.

Toda (198, 1998) wrote a paper on “Special Librarians in the Twenty-First as an Information Professional”. He believes that librarians should change into special librarians if they want to survive their effective role in libraries, in 21 century. The changes should account for five areas of ICT, information literacy, user training, distribution of information rather than storing and guiding users towards knowledge. Libraries should change into consolers for the users.

Hollander and Martin (68, 1999) conducted their study on “Public Health Professionals in the Midwest: a Profile of Connectivity and Information Technology Skills”. They collected the data through a questionnaire which was mailed to local health departments (LHDs) in the ten states of the Greater Midwest Region of the USA. Overall, 85% owned a computer that would allow internet access. Half of LHDs provided internet access to some or all staff. Two thirds of these staff used e-mail and half search the web. 50% were linked to the State Health Department and 30% were connected to other local health departments. Databases that they used were CDC-Wonder (more than half); and MEDLINE (less than 20%). Three-fourths of respondents were attracted in learning more about the internet. 69% of
respondents intended to develop electronic communication capacity within the next year. They concluded that public health practitioners needed convenient access to information to help them in promoting the health of the American public.

Chandrakumaran (29, 2000) studied “Internet Access to Oncology Information” to find out the advantages and facilities offered by the Internet to doctors and scientists engaged in health care and research. In this paper, he listed a range of core resources available on the Internet to health professionals. MEDLINE, ENBASEM, Listserve and Telemedicine were described as the most significant services useful for doctors and scientists.

Morse (123, 2000) carried out a study on “Comparing Patterns of Print and Electronic Journal Use in an Academic Health Science Library”. He attempted to compare the usage of a matched set of biomedical literature available to users both in print and online. The results indicated that for journal volumes in the study (the 1998 volumes of 194 titles), users accessed the electronic versions more than 10 times as often as the print versions during a period of 6 months. The results further indicated a remarkably similar usage pattern in the print and electronic data, with just (20%) of titles accounting for nearly 60% of usage in both study sets. Conversely, the bottom (40%) of ranked titles in both the print and electronic study sets accounted for just (9%) of total usage. Studies like this one reveal the great preference of users for electronic access when available to them, especially when they can link directly from databases to the full text of the articles indexed.

Singh (175, 2000) in his research entitled “Impact of Information Technology on Biomedical Information Centers and Libraries in India: A Critical Evaluation” attempted to find out the scenario of biomedical ICLs in India with respect to availability and use of certain IT. He also tried to evaluate different aspects of IT and suggested solutions to the related problems. Furthermore, in brief, he attempted to determine the impact of IT on the practice of biomedical librarianship; the interaction and use of ITs by the biomedical ICLs, users and professionals; changing role of
biomedical ICLs, professionals and users and preparedness to cope with the changing scenario. The data was collected through 3 sets of questionnaires (General survey of biomedical ICLs, User awareness about IT, Experts opinion about the use of IT) and interviews. He found out that the government of India should directly support ICLs for the development of IT; the significant changes in quality and quantity of IT were restricted to big cities and bigger ICLs; the existing hardware and software did not satisfy the needs and were not standard; majority of biomedical ICLs could not cope with rapid growth of IT; there was a need for a national network for biomedical ICLs; it was required to employ IT trained staff. It was concluded that the two times survey data indicated the positive impact of IT on users and professionals and biomedical ICLs services as well.

De Groote and Dorsch (40, 2001) conducted a study entitled “Online Journals: Impact on Print Journal Usage”. They aimed at finding the impact of online journals on the use of the print collection in a health sciences library. It was indicated that print journal usage decreased significantly with the introduction of online journals, even for journals available only in print. Most of the respondents were willing to use online journals rather than print ones due to their easy access.

Dulle and others (45, 2002) conducted a study on “Application of Information Technology for Research in Tanzania: Feedback from Agricultural Research”. The study intended to evaluate agricultural researchers’ access to Information Technology (IT) facilities and the extent of use of such facilities. Data was collected through a questionnaire survey sent to agricultural researchers selected randomly at 13 research centers throughout Tanzania. 244 filled questionnaires were returned. The results indicated that 170 (69.7%) of respondents had the access to Internet or electronic mail, 79.3% of these mentioned they used the facility frequently for information search. The E-mail facility was not been popularly used for information requests to sources outside respondents’ institutions. CD-ROM technology was found not to be readily accessible to many respondents because of the lack of such facilities at their
research centers and the minimal use of E-mail facilities for resource sharing with other centers' CD-ROM databases. The researchers concluded that along with a low level of IT development in the country, the available IT facilities were been fully developed to facilitate agricultural researchers' access to information. Some measures to promote IT infrastructure and its use for improvement of research productivity were recommended.

Cochenour and Moothart (31, 2003) carried out a user survey which aimed in particular to determine whether all faculty, administrative professionals and graduate students at Colorado State University supported canceling print subscriptions when they were duplicated by electronic equivalents. They sent a printed questionnaire to a sample of 6968. The results of the study indicated that although overall (95.6%) supported or strongly supported dual print/electronic subscriptions, only 74.3% supported canceling print subscriptions when they were duplicated by electronic equivalents; 25.7% opposed or strongly opposed canceling print; 77.4% were in favor of electronic-only subscriptions under the condition that the publisher guaranteed continuous access.

Uddin (205, 2003) carried out a study on “Internet Use by University Academics: A Bipartite Study of Information and Communication Needs”. The investigator mentioned that there were only 0.2 million Internet users out of a population of 140 million in Bangladesh. Due to the fact that there was a lack of academic research on Internet usage, the prime objective of the study was mentioned to be providing a report on the level of the Internet use by university academics for their information and communication needs. The study also investigated to find out whether there were differences in use of the Internet among the various levels of academics. Six categories of information and communication needs were identified while the survey was conducted among Rajshahi University's lecturers. The findings of the study indicated that Internet use by academics was useful for some common needs and that the academic rank of users was a significant factor in determining the priority of needs. The study accounted for
problems and revealed that there were some barriers to the adequate use of the Internet resources. Recommendations were made for increased use of the Internet that benefited the nation as a whole.

Banwell, et al. (19, 2004) in their article intended to provide a baseline for future studies on the provision and support for the use of digital or electronic information services (EIS) in further education. The analysis presented was based on a multi-level model of access, which included access to and availability of ICT resources, access to and availability of EIS resources and the staff skills and their development. The research was carried out within the third cycle of the Joint Information Services Committee (JISC) User Behavior Monitoring and Evaluation Framework, in 2001/2002. Evidence was gathered from library and information service web sites and various stakeholders, including library and information service staff, academic staff and students to create insights into the provision of access to EIS in further education. It was indicated that sector-wide funding initiatives had a significant impact on ICT infrastructures which attracted a positive response from students. EIS were represented on some library web sites but both web site development and EIS availability were very much less advanced than in higher education. Staff lacked adequate dedicated access to ICT to be able to develop their own skills and use. There was a low level of access to electronic information resources, with only limited access to the resources through library web sites. LiSc managers encountered a number of challenges in enhancing this provision, including licensing arrangements, tight budgets that needed to be broaden across many discipline areas and the absence of EIS designed specifically for the further education student. The other important challenge lied in the allocation of time and opportunity for academic and LIS staff to develop their ICT and EIS skills and more generally in the further development of the role of Information and Learning Technology Champions.

Fitzgerald and Savage (54, 2004) in a research investigating the current ICT developments, challenges and issues of public libraries in Victoria, Australia, aimed
at exploring the impact on public libraries as they became increasingly dependent upon ICT to manage, access and deliver information services. They mentioned that Libraries Online and Rural Libraries Online had been developing Internet access in Victorian public libraries since 1998. These libraries were funded by State (Multimedia Victoria) and Australian Federal (Networking the Nation) and delivered by VICNET, a division of the State Library of Victoria. The projects provided a library approach to e-services which included provision of bandwidth, infrastructure, ICT skills and content. The specific projects such as satellite delivery of bandwidth, rural points of presence (POPs), Victoria’s Virtual Library, the Gulliver Consortium and the SWIFT Initiative were discussed. It was indicated that the actual ICT models and implementations was the capacity of the 44 individual public library services to understand and meet the ongoing issues.

**Franklin and Plum (56, 2004)** studied “Library Usage Patterns in the Electronic Information Environment”. The results indicate that sponsored researchers at the health sciences libraries used networked electronic services most intensively from on-campus, but not from in the library. The purpose of use for networked electronic resources by users within the library was different from the purpose of use of those resources by users using the resources remotely.

**Luambano and Nawe (101, 2004)** conducted a study on “Internet Use by Students of University of Dares Salaam”. The study’s objective was to find out the purpose for which students of the University of Dares Salaam used the Internet. The study wanted to investigate the purpose of use, the level of students’ access to the Internet, as well as the problems students faced in the use of Internet. The study revealed that the web site had specific information on faculties, institutes and departments, including training programs. There was OPAC installed at the Main Campus and UCLAS libraries to replace the manual card catalogues. The OPAC had simple and advanced search options, using Adlib software. There were plans underway to convert the manual catalogue of MUCHS library into an online catalogue. Data was collected through questionnaire and interview. Participant observation and focus group discussion were other means of data collection. The
The results of the study showed that the level of students' access to the Internet was low due to the major reason of inadequacy of computers with Internet facilities. The students who had access to the Internet were not using it efficiently. They used it mostly for communication with friends and relatives rather than for academic purposes, because of the lack of skills required for effective use of the internet. The researchers suggested providing more computers with Internet facilities, increasing Internet access speed and providing more chances of training in Internet use.

**Mahapatra and Padhi (104, 2004)** carried out a research on “Application of Information Technology in Libraries in Orissa: Problems and Prospects”. The paper determined the problems of IT application in Orissa libraries. They indicated that the main barrier towards library automation in Orissa was the scarcity of funds. The researchers mentioned the requisites of IT that were necessary for the implementation of IT in organizations and ICLs. These requisites were: sufficient fund for establishment of appropriate computer system and its peripherals (hardware, software, databases, networking, etc.); trained library professionals having adequate exposure to IT; ongoing education in IT for the staff; increasing motivational aspects of the professional by the management; development of different types of networks to various types of libraries; and IT orientation training programs, workshops and seminars are to be conducted by establishing IT institutions. The existing problems in terms of IT and its application in libraries of Orissa were stated to be: lack of definite and clear goal of IT by the parent organizations; absence of adequate enthusiasm and attitude of library authority; inadequate fund provision for computerization of libraries; lack of adequate training facilities and absence of IT education in the state for the library professionals; lack of appropriate user education programs and absence of right and appropriate technology and equipment for modernization of library.

**Wingenbach and Hamilton (215, 2004)** studied “Information Technology Use and Effectiveness in the Texas-Mexico Initiative”. The investigators mention that IT use and its effectiveness does not provide the same reliable resource in
lesser developed or developing countries as it does in developed countries. The study intended to determine Information Technology uses and effectiveness in distributing research results from the Texas-Mexico Initiative through the Centre for Grazing Lands and Ranch Management. Two of the three northeast Mexico Campuses in this study possessed and used complicated IT in order to communicate with researchers outside state and country. The Internet and Computer-Mediated Technologies (CMT) such as E-mail and video-conferencing were the main method for this exchange. Texas and Mexico witnessed a growing inter-dependence due to increased communication and knowledge exchanges. It was revealed further that while universities had access to this information, rural communities did not. Rural farmers and producers had to rely on agricultural institutions to have the information necessary to increase their income and land sustainability. It was suggested that to accomplish real economic improvement for the agricultural sector, universities must continue to enhance their effectiveness in disseminating information to farmers and local producers. Distance education, if employed properly, could provide an economically appropriate method for reaching a larger percentage of rural communities.

Adogbeji and Akporhonor (1, 2005) in a paper entitled “The Impact of ICT (Internet) on Research and Studies: The Experience of Delta State University Students in Abraka, Nigeria” attempted to explore how students were increasingly using the Internet to support instruction and research needs in addition to heavy e-mail usage. A questionnaire was used to survey a sample of students about their internet practices. Findings revealed that students had more background in technology and used the internet and other ICTs. Also, more positive impact from the Internet in almost every aspect of academic life has been indicated that implies the need for more access at reduced costs on and near the campus. It has been predicted that the demand for internet service would continue to grow. The main problem indicated is the access facilities to internet. The study concluded that more and more university affiliates would need improved access to internet resources. Therefore the university should respond to meet this greater demand.
Ani, Esin and Edem (5, 2005) in a study entitled “Adoption of ICT in Academic Libraries” investigated the status of ICT in university libraries of Nigeria. The data was collected through postal survey. Almost 60% of the University Librarians out of the 29 university libraries surveyed returned the completed questionnaires. The results of the survey indicated that only six university libraries were fully "computerized", nine were "about to be computerized"; seven of the surveyed libraries installed local area networks, five had online public access catalogue and only four libraries provided internet service. They found out that there were two major obstacles in the way of adoption of ICT in university libraries: insufficient funds and the poor state of electricity in Nigeria. To develop ICT in university libraries it was recommended that the federal government increased the present level of funding of Nigerian university and the poor state of electricity be improved by the federal government. The researchers believe that computer networking of university libraries is quite practicable if the government take actions to solve the mentioned problems.

Asemi (11, 2005) conducted her Ph D thesis entitled “Impact of Information Technology in the Development of Medical Libraries and Information Centers in Isfahan Medical Science University (IMSU) Iran”, to see how information technology has affected the development of different activities in the medical libraries and information centers. She maintains that the quality of medical research depends largely upon the efficient interchange of information in ICLs. On basis of the data it was made clear that ICLs faced the problems like corruption and deletion of data, low speed connectivity, shortage of hardware facilities, distance between the center and central library and lack of experienced staff. In addition, these libraries were also facing inadequate financial resources for automation process and also they did not have proper guidelines for automation. The mentioned problems needed immediate action of the authority and continuous support from administrators in parent institutions.
Hoskins (69, 2005) in his research on “ICT Knowledge and Skills of Subject Librarians at the University Libraries of KwaZulu-Natal” mentions that basic capabilities for librarians must include knowing what the Internet is and is not; evaluating and using hardware, software and networks; and understanding basic computer and information science concepts. It is also necessary that every librarian be familiar with all components of an office suite: word processing, spreadsheets, databases and scheduling programs. Furthermore, librarians should be able to choose the appropriate application for the projected result, that is, a database for lists repeating the same type of information, spreadsheets for tracking numerical data, word processing for forms, for instance. They should know what is attached to their CPU and how it is attached. They should be able to perform basic troubleshooting functions: power source, monitor adjustments, reboots, printer response and how to write down error messages. Librarians should be acquainted with installing, configuring and using a browser and should be able to discuss intelligently their favorite search engines on the Web and explain why they use each one. Librarians should discuss when a Web search is preferable to a print search and vice-versa. Every librarian should be familiar with e-mail and its more sophisticated functions. All staff should be familiar with whichever version of Windows is run within the organization, how to navigate through Windows and how to manage files associated with Windows. Also, every librarian should be familiar with the functions of the public access workstations and also the care and maintenance of those installations hardware as well as software. A basic understanding of their institutional network design, LANs and WANs is needed for librarians, so that they can perform a minimal level of intelligent troubleshooting. Librarians who are Webmasters need to have a functioning knowledge of HTML (Hyper Text Markup Language), tables, browsers, graphic placement, CGI (Common Gateway Interface) programming, UNIX and Java. All these abilities and skills make challenges for librarians. Therefore, ongoing training is quite crucial and necessary if today’s libraries are to keep up with changing technology.
Scoffery and others (161, 2005) did a study on “Internet Use for Health Information among College Student”. They maintain that retrieving health information is increasingly common through the use of Internet. They surveyed 743 undergraduate students at 2 academic institutions to evaluate their Internet use, health-seeking behaviors and attitudes related to the use of the Internet in obtaining health information. 53% of the respondents stated that they were in favor of getting health information online and 28% mentioned that they preferred to attend a health program online. Overall, 74% of the respondents indicated that they have received health information online and more than 40% mentioned that they frequently searched the Internet for information. To find health information, they used various search engines and multiple web sites. It was crucial for if the information on health web sites were reliable enough. The Internet use for health information was different according to students’ gender and level of the Internet experience.

Al-Ansari (3, 2006) surveyed “Internet Use by the Faculty Members of Kuwait University”. The study attempted to find out the patterns of the Internet use by the faculty. It also investigated the purposes for using Internet, its impact on teaching and research, the Internet resources that they used and the problems faced while using the Internet. A questionnaire, expert-reviewed and pilot-tested, was used to collect data from the faculty of four colleges: Arts, Social Sciences, Sciences and Engineering in Kuwait University. Half of the 491 potential participants were selected as the sample, with a response rate of 62.6 percent. It was indicated that a large majority were using the computer and the Internet for more than five years. They used the Internet mostly for e-mail, search engines and WWW resources mainly for the purposes of communication, research and publication. Internet helped the faculty to save time, find up-to-date information and cooperate with their colleagues. The major problems were slow speed, lack of time and lack of access from home. Most of them were interested in improving the internet use skills through formal training. The study implied that Kuwait University needed to improve its IT infrastructure, provide distance access and formal training in the use of the Internet resources. This study was the first comprehensive study of the use of the
Internet by the Kuwait University faculty. Its findings would help Kuwait University in its plans and programs related to e-learning and strengthen relevant resources and services of its libraries.

Atilgan and Bayram (13, 2006) carried out a study entitled “An Evaluation of Faculty Use of the Digital Library at Ankara University, Turkey”. They surveyed faculty in 2002 to find out the level of awareness of digital library resources, particularly journal articles, along with their usage rate and also to evaluate the preferences of faculty for specific electronic databases. They gave a questionnaire to researchers at Ankara University. 1996 usable questionnaires were returned to the investigators. The main findings were that the majority of respondents (86.5%) maintained that they knew that digital library resources exist in Ankara University. Many of the faculty members (88%) use electronic databases. Associate (67.8%) and assistant (63.4%) professors used electronic databases more than full professors (53.8%) and research assistants (55.4%), although they were not more aware of the digital library than the second group. It seems possible that there is a positive impact of newly subscribed databases on this increase in publishing.

Creaser, Hamblin and Davies (37, 2006) in “An Assessment of Potential Efficiency Gains through Online Content Use” studied the amount of use from online material. They maintained that online content might have largely replaced traditional print-based resources as the primary tool for literature searching throughout much of the academic and research community. The paper presented the successful results of small-scale study, commissioned by the JISC in 2004, in order to evaluate the potential efficiency gains that might be achieved through the use of online content by researchers.

Emojorho and Adomi (48, 2006) conducted a survey on “An Assessment of the Use of Information Technology Facilities for Academic Pursuit”. They wanted to investigate the extent to which staff of Delta State University, Abraka, Nigeria, were familiar with IT and used IT facilities for academic purposes. Questionnaires and
interviews were the main instruments used for collecting data. Data indicated that most of the staff were aware of the existence of IT facilities and employed them to satisfy their academic needs. The worst problem encountered in the use of IT facilities was epileptic power supply, while other problems included high charges of internet services, unreliable telecommunication infrastructure, Internet traffic congestion due to limited bandwidth and substandard performance of the Internet service provider. The study acted as an eye-opener for the staff and management of Delta State University, institutions of higher education in Nigeria as a whole, as well as the government to show the true state of affairs connected to how far and well they advanced in the application of IT for developmental purposes in comparison with the world state of affairs.

Kumar and Kaur (91, 2006) conducted a survey on “Internet Use by Teachers and Students in Engineering Colleges of Punjab, Haryana and Himachal Pradesh States of India: An Analysis”. The purpose of the study was to analyze the use of the Internet and related issues among the teachers and the students of engineering colleges in India’s three States of Punjab, Haryana and Himachal Pradesh. The data was collected through a questionnaire distributed among the 1980 teachers and students of all the engineering colleges of the three states of India under study. The paper indicated and elaborated the various aspects of Internet use including: frequency of Internet use; methods used for learning of Internet skills; most frequently used place for Internet use; purposes for which the Internet is used; use of Internet services; ways to browse the information from the Internet; problems faced by the users and satisfaction level of users with the Internet facilities provided in the college. The result of the survey also explained the benefits of the Internet over conventional documents. The study was carried out particularly to find an answer to the question as to whether the Internet can replace library services. It was revealed that the Internet had become an essential instrument for teaching, research and learning processes of these students. Some suggestions were provided to make the service more beneficial for the academic community of the engineering colleges under study.
Mula and Chandrashekara (126, 2006) conducted their study on “Internet Users: Mysore University Campus (India)”. They mention that the Internet being a computer network is made up of thousands of networks worldwide. Internet and the Internet based information resources are essential to rise above the distance barrier in information explosion era. It also saves the time when searching the literature in electronic form and allows identifying the resources. The teachers, research scholars and students of higher education use the Internet to keep themselves up-to-date. The study gives an insight into why these people are interested and what is their attitude towards the use of Internet based information resources and the Internet use.

Natarajan (127, 2006) evaluated “Use of Online Technology for Multimedia Education”. The researcher assumes that the content, media and administration are the main areas for better multimedia education through online technology. He mentions that with the arrival of ICT and the growth of the Internet, particularly the Web has changed the way of presenting the curriculum materials to the students in online environment. The materials are presented in both printed and in e-formats. The online teaching tools such as e-mail, discussion list, chat mode, lecture notes via web, use of computer mediated communication, interactive web tutorials, CD-ROM materials and virtual environments are for better understanding of the students. The successful use of online technology depends on many factors as: well designed and planned courses; appropriate infrastructure, prices and capacity; training in the chosen technology; suitable local design; proper pre-testing; and relative ease of access. Technologies such as video and the Internet can be combined with hands-on activities to improve critical thinking and support learning skills. In India, distance education is provided through Radio, TV, CD-ROM and contact classes on weekly holidays. Some private institutions have started using the online technology for educating the students. The author concludes that Indian Universities and Higher Educational Institutions should adopt IT for easy understanding of education programs.
Hardesty and Sugarman (62, 2007) did a survey on “Academic Librarians, Professional Literature and New Technologies”. They mention that it is very important for academic librarians' success to keep abreast of professional literature and the latest trends in librarianship and related fields. The ability to keep current is more and more of a challenge for the librarians due to the increasing amount of information available twenty-four hours a day. Moreover, the growth of the profession into areas such as classroom teaching, information systems and Web technologies mean that librarians cannot limit themselves to gathering information and reading literature from strictly the “library” field.

Kaur and Singh (84, 2007) study “Information Technology Challenge for University Library Personnel”. The paper discusses the changing culture of university library in the age of information technology and use of internet in solving problems of users to access library resources through networks. They emphasize the role of ICLs due to the existence of new technologies that have made the information seeking very demanding and dynamic. ICT has improved the prospect of users for timely, relevant, easily available, filtered and tangible information services. ICT has provided a suitable convergence between information and communication. The internet and cooperative technologies have been successfully used for effective information exchange, to develop ICLs and to access library resources through networks.

Kumbar and Raju (94, 2007) conducted a research on “Use of Internet in Engineering Colleges of Three Districts of Karnataka State”. Studying the Internet facilities and internet usage pattern amongst the students and faculty members was the purpose of the study. They mentioned that study had a vital significance in redesigning the policy framework to suit to the modern ear with more emphasize on information more and more. They indicated that the survey would help them in great deal to identify the areas to provide better internet services to the students and Faculty members of the respective engineering colleges.
Shariful Isalm (166, 2007) did a comparative study of selected libraries of Bangladesh. He studied the ICT facilities and services the libraries provided to their users. He found out that there were problems in the way of adopting ICT facilities including: administrative barriers, lack of shared initiatives, lack of skilled manpower, lack of financial support, lack of infrastructure, lack of ICT resources, absence of local resources, lack of long-term planning, psychological barriers, lack of ICT training programs, lack of networks and lack of E-Resource selection policy. The researcher concluded that the situation could change for the better if librarians, library patrons and supporters and, above all, the government, helped develop ICT-based libraries to meet the changing demands of the users.

Shrivastava and Nandwana (168, 2007) conducted a study on “User Education in Networked Environment with Special Reference to National Institute of Technology Libraries in India”. The problem that they investigated was that due to new emerging information and communication technologies, there were number of web based and online resources available now-a-days and users were not very much familiar with these new emerging resources such as online and web based resources. They mention that in a networked environment it becomes essential to educate the user to use a computer system. The role of ICLs has also been changing and challenging with the advent of fast growing information technology since last decade especially with the emergence of computer application, telecommunication networks, fax, CD-ROM, E-mail, optical scanning, hypertext and hypermedia, videotext, multimedia technology, on line databases, electronic publishing, voice-mail services, tele-conferencing, radio paging and mobile phone system etc.

Stephen, Saravanan and Lawrence (186, 2007) studied “E-mail Usage among the Academic Librarians”. They intended to study the e-mail usage among the academic library professionals. They maintain that E-mail provides a worldwide communication network for all social, cultural economic and professional aspects of
life. E-mail also provides quick and efficient channel for exchanging information in
different formats such as textual, numerical and image based, also it is one of the
cheapest and economical medium for communication. Respondents mostly
mentioned that they used e-mail for the purpose of communication with friends and
for submitting research papers for conferences. They conclude that e-mail
technology adds value to the service of library professionals only when its features
are used at maximum. Also, awareness among the professionals is necessary to
make sure the optimum utilization of e-mail as communication medium.

Vasishta (210, 2007) carried out a study under the title of “Library
Automation and Networked Services: A Case Study at the Technical Deemed
University Libraries in North India”. The researcher attempted to discuss the status
of library automation and networked services at six technical Deemed University
libraries in North India. The data was collected through a questionnaire. The study
included identifying the software packages being used, identifying library functions
and services been or being automated, determining automated and networked
services being provided. Various aspects like selection of library automation
software, databases developed, computerized services and networking services etc
are explained. It was indicated that to keep pace with the changing needs,
amINATION of these libraries was on progress. Libraries are looking to maximize the
benefits of automation by spreading computers use to as many aspects of library
activities as possible by taking advantage of developments in computer hardware,
software and telecommunications. Much work was underway and major advances
were already achieved. There was a transition from traditional to automated
libraries, to form hybrid libraries. ICLs were heading towards complete automated
libraries very fast, which will in turn tremendously improve the services for the full
satisfaction of the user.

Yadav, Yadav and Nigam (218, 2007) conducted a descriptive study entitled
“Revolution in Library Technologies: An Era to Know How and Its Transfer”. They
maintain that information technology help remove barriers of distance or time. They
claim that there will be no limit of variety of ways on which modern technology is applied in speedy retrieval of information most consistently. They go over the advantages of information technology with biotechnology and Bioinformatics which provides greater avenues for easy access to information, improving efficiency of functioning of the libraries education system and ultimately improves the life quality. It is concluded that it is highly required that librarians, teachers, researchers and students equip themselves through appropriate training of this new technologies to serve better and derive more benefit from the improved system.

Dilek-kayaoglu (42, 2008) did a study entitled "Use of Electronic Journals by Faculty at Istanbul University, Turkey: The Results of a Survey". The purpose of the study was to examine the attitude, behavior, perception and preferences of the Istanbul University faculty on e-journal use. The data collection was done through the web. An e-mail was sent to all academics to describe the survey. A total number of 590 questionnaires were collected. Respondents were asked how frequently they used printed or e-journals (or the electronic equivalent of print). The results showed that overall, 75.6% and 64.1% of respondents were 'frequent' and 'very frequent' users of e-journals, respectively. At the same time, 64.7% of the respondents mentioned that they were 'infrequent' or 'non-users' of print journals. The majority of very 'frequent' users of e-journals were from the health sciences (70.8%), followed by the natural sciences with 63.6%, social sciences with 52.5% and humanities with 51.7%. The 'non-users' were respectively from the humanities (13.8%), from the social sciences (2.5%), from the natural sciences (1%) and from the health sciences (0.8%). The respondents were asked for their reasons for using e-journals, 67.5% of the respondents mentioned that they used e-journals for research, 49.2% used them for keeping updated on the subject field, 28.5% for browsing core journals and 16.9% for teaching. In expressing the format they preferred, the majority of the respondents stated that e-journals were equivalent to printed journals; preferred the electronic versions over printed one; and supported the transition from print to e-only. The researcher found that for 59.7% of the respondents, regardless of discipline, the major barrier to use of e-journals was the lack of sufficient subscriptions in their
discipline which indicated that the library should increase the number of e-journal subscriptions.

**Varghese (209, 2008)** in a study on “*User Studies in the Electronic Environment: Review and Brief Analysis*” reviewed 87 user studies by various authors around the world. The topics selected were: information search pattern, use of internet, use of electronic information services, information seeking behavior and information need and use. It was concluded that due to the constant development in the provision of recent electronic systems, there should be a comprehensive understanding of the information services. There should be additional studies, perhaps using alternative research methods and conceptual frameworks, to provide the information science community additional evidence to develop a more in-depth understanding of the users of information services.

**Zalzadeh (220, 2008)** conducted a research on “*The Use of Information Technology in Academic Departments of Library and Information Science in Iranian Universities*”. He attempted to investigate the status of IT utilization among Iranian LISc faculty members and students, the users and non-users of IT, the purposes of IT use, IT facilities and services used by the same group. Questionnaires and interviews were employed for data collections. The data was collected from 120 faculty members and 390 students. The findings indicated that 95% of LISc faculty members and 87% of students used IT. Unfamiliarity, inaccessibility and lack of time were the major reasons of not using IT. 38% of faculty members used IT for classroom lectures and 18% used it for workshop presentations. In research activities, 34% of faculty members used the IT for writing books/articles/papers and conference presentations. In case of students *Information seeking, doing research works and leisure time were their purposes for using IT*. Faculty teachers used computer (94%), Internet (94%), Intranet (45%), online data banks (80%), offline databanks (87%), CD & DVD (81%) and multimedia (62%). In case of students it was indicated that they used computer (88%), Internet (87%), Intranet (46%), databanks (65%), CDs & DVDs (76%) and multimedia (57%). Internet was the most
popular network among the information networks (i.e. Internet, Intranet and LAN) being utilized by LISc faculty members (94%) and students (87%). LISA and ERIC were the two databanks used the most (57.5%) among faculty members, while in case of students, LISA, BIP and Serial Directory were used the most. Pars Azerakhsh and Seemorq (software for libraries in Iran) were the two widely used library software among faculty teachers and students. The main problems reported by faculty members were: inadequacy of computers, printers, software, databanks and supplies, technical support, outdated capabilities for hardware, software, Internet connections and networking, inadequate training and experience for faculty members, inadequate funding and budget to purchase new IT facilities, lack of projection systems and audio visual aids in classrooms. The researcher recommends studying the use of IT in other academic departments and including IT in LISc curriculums in universities in Iran.

2.2. National Scenario (Studies in Iran)

Hajebi (61, 1992) conducted a study on "Medical Science Researchers’ Awareness with Information Resources in Iran". She evaluated medical science researchers’ awareness of the information resources. Findings indicated that 39% of respondents used Medline database and 2% used EM Base. Reasons reported by respondents for not using Medline were inaccessibility to Medline (48%) and unfamiliarity (33%). Only 6% of respondents used online systems for retrieving information.

Mirjood (120, 1992) in his study entitled "A Survey of Attitudes Towards and Awareness of Library Managers of ICLs" in Health Science Public Universities, IAU and Emam Hossein University about mechanization of library activities indicated that since utilization of new communication technology in library activities asks for managers' awareness of computerized systems, it is necessary to study the extent of their knowledge of computers. The results indicated that 18% of managers had formal training on computers. Half of them went through short training classes but 32% did not have any training on computers. In addition to computer knowledge, it
is important to know their attitude towards mechanization. Majority (90\%) of managers considered the use of computers in libraries as a must and supported in mechanization. The study revealed that only 16 libraries had computer equipments where some of library activities were computerized, mainly in reference sections. The reasons of not using computers in other university ICLs mentioned to be lack of computer equipments(50\%), lack of trained staff(68.75\%), budget shortage(31.25\%), lack of software(18.75\%), lack of need(18.75\%) and other(60.2\%).

Masoomi (109, 1993) in her thesis under the title of "A survey of Information Needs Pharmacology Sciences and Designing a Proper Model to Meet the Needs", proposed this hypothesis that the research needs of pharmacology experts are different from educational needs of pharmacology experts in academic centers. Findings of the research indicated that the use of information in these two groups differed according to the various needs of them and this was because of different occupations they were involved in.

Farajpahlou (53, 1994) in a study on “Status of Library Automation in Iranian Academic Libraries”, tried to illustrate the present state of automation in Iranian academic libraries. The findings were driven from a survey conducted in 1991. The backdrop of library automation in Iran was described and the survey conducted was explained in terms of methodology and findings. Computerization of library services in Iranian academic libraries initiated in the late 1970s and after an apparent gap resumed in the late 1980s. At the time of the study, the UNESCO software, CDS/ISIS, was playing a major role in computerized library services in Iran. A number of local commercial software companies emerged in the last few years which developed library software based on other available commercial software, as well as locally developed ones. Some libraries were also involved in the development of library software. There were problems in the way of library automation in Iran. Lack of networked bibliographic databases, unadjusted status of library education programs that dealt with modern technologies and lack of
structured strategic plans for library automation were the main problems that the Iranian academic libraries had to encounter.

**Gharibi (60, 1995)** Director of Iranian Information and Documentation Center (IRANDOC), presented the First Government Report of Islamic Republic of Iran about status of library and information services in the Islamic Republic of Iran in the ASTINFO/10th Consultative Meeting Workshop/Seminar. He reported that collections in university libraries were more than 6 million books, half in English or Arabic or other foreign languages. A survey of all the 908 libraries in the country, indicated that only 6% of libraries had more than 20,000 'books' in their collection. In another survey of 270 university libraries, only 1.8% had over 100,000 books (in 1993). Out of total 908 libraries, there were 123 government affiliated scientific and special libraries, which tend to be the first to seek and use the latest technologies and equipment for the development of their services. Out of 908, 150 had CD-ROM drives including 300 CD-ROM database titles. 28% of libraries had databanks and online capacity. He found that modern library practices had been adopted in Iran actually rather recently, through correlation with Western systems and by establishment of special academic courses and finally a department of library science at the University of Tehran in 1966.

**Khosravi (87, 1997)** in his research entitled “A Survey of Users Satisfaction in Using CD-ROM Bibliographical Databases Offered by Ministry of Jahad Sazandegi's ICL” studied the methods of access to data and the sources the participants used through that ICL. He stated that more than half of researches were satisfied with the method of requesting and receiving the information. They also expressed their satisfaction with the relatedness of the information to their needs and the richness of information.

**Okhovati (129, 1998)** carried out a research entitled “Use of the Internet by Faculty Members in Medical Universities of Iran, Tehran and Shahid Beheshti.” The results indicated that the respondents used the Internet mostly for research works.
(88.2%). Also 66.7% of faculty members used the Internet in order to communicate with their co-workers. The percentage of use of internet by faculty members who were involved with both treatment and teaching was higher than those who were involved only with treatment activities.

Salajeghe (155, 1998) conducted a study entitled “A Survey of Attitudes of Internet Users in Shiraz University of Medical Sciences on the Quality of Network and Access to the Information”. The results showed that the users had a positive attitude towards the quality of network and access to the information. The main problem was the low speed of retrieving information. The most important reason they mentioned for the use of internet was getting familiar with electronic journals and other sources of information.

Setoode (163, 1998) did a research on “Evaluation the Use of Electronic Information Among Shiraz University and Shiraz Medical University with Special Reference to the Internet and Optical Discs.” The results indicated that the extend of use was not much high. The most used services were e-mail and web. According to findings, the main factors which had impact on the use of these services were the variables such as: sex, degree, academic rank, computer knowledge and training. She found out that those respondents, who were active in research activities, were also active in Information seeking.

Ashori (12, 1999) carried a study on libraries of mental hospitals. The data was collected through a questionnaire filled out by library users. The results indicated that 75% of these libraries did not have computers. There were not any microfiche readers, any coping machines and audio visual equipment. There was a rare amount of information in these centers due to the lack of electronic connectivity to Medline net.

Vakilimofrad (207, 1999) did a research on “Use of Information Technology by Heart Specialists in Medical Universities of Iran, Tehran and Shahid Beheshti”.
He used descriptive analytical research method and collected the data through 68 questionnaires. The results showed that 67.6% of the under study heart specialists used IT. The specialists that did not use IT express the reasons as lack of access (77.3%), lack of awareness with IT (68.2%) and lack of time (63.6%). The most used technologies among the respondents were: Video-films (78.3%), educational discs (65.2%) Internet (60.9%) and on disc databases (47.8%). They used IT in hospital libraries, hospitals and homes. The main purposes of using IT were: Teaching (89.1%), treatment (84.8%) and obtaining update information (73.9%).

Davarpanah (39, 2001) in his paper studied the level of information technology (IT) application in university libraries in Iran. The paper aimed at presenting current status of IT application in the libraries. The investigator surveyed the whole population of 79 university libraries under the jurisdiction of two Iran’s ministries: MSRT and MHTME. The researcher discussed the significant differences between the level of IT application in two library groups, i.e. MSRT and MHTME and also the relationship between the level of IT application and the number of computers in use and the annual expenditure on IT. The paper concluded that the automation of Iranian university libraries is a continuous exercise.

Jalili Dizaji (81, 2001) conducted a study on “Use of Optical Discs Databases in Iran: A Study of the Present Situation and Proposal for a Desirable System”. He indicated that less than half (47.32%) of ICLs in Iran automated their services, while majority (52.68%) still needed automation. He stated that an overwhelming majority (75.21%) of ICLs in Iran equipped with online information systems were connected to local area online system, while the connection to the regional online systems was much smaller (28.21%) than local area online system.

Mahpooyan (107, 2001) in her thesis entitled “A Study of Use of Information Technology in Educational Hospitals’ ICLs in Tehran.” studied 39 educational hospitals’ ICLs affiliated to three universities of Medical Sciences: Iran, Tehran and Shahid Beheshti. The results revealed that these ICLs used 13 different kinds of
hardware facilities among which telephone (100%), computers (68.4%) and CD-ROM (60.5%) were the most available facilities. There were 7 types of software facilities. The highest number was related to educational optical disks (73.7%) and there was no DVD available in ICLs. Respondents ranked the priority of use of ICT facilities as in the order of: Internet, online databases, CD-ROM databases, educational optical disks, overhead projector, video films, audio cassettes, slides and national networks. The researcher concluded with a series of suggestions to promote the existing conditions.

Salami (156, 2001) carried out a study on “A Survey of Pharmacology Students and Resident's Amount of Access to Their Required Articles Through the Libraries of Iran Pharmacology Colleges”. She attempted to investigate the access of pharmacology students and residents to the articles they needed for academic purposes. She found that Proquest and ADONIS (online/CDs) as two important databases helped the subjects of the study to increase their access to the required articles and information up to %20.

Torabi (199, 2001) presenting a paper on “Building the Virtual Health Sciences of the Eastern Mediterranean Emerging medical Informatics systems and medical library services” believes that developing countries can not catch up with the pace of advances in technology and are left behind to compensate this weakness by employing technology. Therefore, these countries should extend their programs based on their circumstances such as human resources, culture and etc, to attain quality. He mentions the strategies and programs that have been developed to reform health information systems in Iran. First, is the design of information systems for medical purposes with emphasis on the issues of extraordinary diversity in creation of possible simulation, the ease of design and possible implementation with different models, the compatibility with the vast number of users and the compatibility with international standards. Second, the transition in the traditional library services and development of modern libraries (multi-purpose) under the name of Health Information Center coupled with
codification of the relevant protocol for this system to achieve providing access to information to anyone who comes to the center, rendering resource sharing services, availing electronic services to all subscribers, providing audio-visual aids at the library, providing access to data-base CDs at all times and rendering Internet access services to everyone while using books or other resources at the center. Third, the pivotal activities in the realm of informatics technology aim at developing the necessary software compatible with the designed, considering of possible employment of new services in intra & extra nets that are provided by other Internet services for medical purposes and planning and supervision on the expansion of telecommunications lines. Based on the mentioned purposes two models have been developed for the network, the design of a special model computer network in the Health Information Center and the design of a model network in the computer center that serves as technical logistics center. Fourth is the design of suitable systems to utilize the available medical information. In order to make use of international resources cost-effective, it is necessary to set up consortiums with the participation of medical universities and affiliated research centers. It is concluded that to enhance health quality across the country and further receives by there should be due attention by the government to allocate funds for the matter.

Hayati and Amoghin (64, 2002) studied graduated and post-graduated students' information needs and the role of ICLs in meeting these needs. The findings of the study showed that despite the emergence of new technologies of information and existence of electronic sources such as CDs, Internet and various databases. These students in Tabriz University used printed sources more than electronic sources only 7.2% of ph D students used CDs and 3.1% of M A students used them. The mentioned reasons for preferring printed materials were lack of knowledge of using CDs and the fact that CDs' information was restricted to bibliographical information and to abstracts.

Effatnejad (46, 2002) in his study entitled “Determining the Extent of Use of IT by Shiraz Higher Education Students” came up with the findings that participants,
MA and PhD students in Shiraz University, used ICT to a great extent in doing their thesis, technical writing and translating papers. But they also complained about the shortage of hardwares and softwares, low speed of retrieving information, disconnection of network and lack of training to use the latest technology. It is interesting to note that only 5.4% of participants did not use ICT in their academic as well as research activities.

Taqipur (189, 2002) in his research entitled “Use of Information Technology by Handicapped Students in Medical Universities of Iran, Tehran and Shahid Beheshti” studied the use of IT by handicapped students in three medical science universities of Iran, Tehran and Beheshti. Data was collected through questionnaires distributed among 60 handicapped and disabled students in the three mentioned universities. The War (Iran and Iraq) has been the major reason of being handicapped. Findings showed that ‘all’ handicapped students in Medical University of Iran used IT, 63.6% used IT in Medical University of Shahid Beheshti and 61.9% in Medical University of Tehran.

Jowkar and Efatnejad (82, 2004) conducted a study on “A Survey on the Use of Information Technology (IT) by Graduate Students in Shiraz University Libraries and Computer Centers”. They aimed at investigating graduate students use of IT in libraries and computer centers of Shiraz University. Findings of the study showed the frequently use of computer and Internet by the respondents. Respondents ‘rarely’ used library software and CD-ROM. They used IT for educational purposes, thesis writing, writing and translating articles. The use of IT for attending national and international seminars, writing book and translating activities was ‘low’. The major problems faced by respondents while using IT were lack of facilities, low speed of retrieval, disconnection of the network, need to learn how to use IT and time limitation to access IT. Also, the findings indicated that 5.4% of the respondents did not use IT.
Mahdizadeh Ghalejoogh (105, 2004) carried out a study on “A Survey of Students’ Satisfaction with the Services of ICL at State Universities of Tabriz”. The results indicated that there should be some more computers and the speed of accessing information should increase. Full text journals, abstracts, indexes and bibliographies were asked to be in more access through CDs. Also, there was a great request for the convenient access to the internet in the ICL of universities.

Safdari and others (154, 2004) conducted a survey entitled “Assessing the Impact of Information Technology on Health System in Viewpoints of faculty Members of Medical Record Departments in Iran”. The investigators aimed to evaluate the impact of IT on health system based on the viewpoint of faculty members in medical record departments in Iranian medical science universities. They used a cross sectional survey and sent questionnaires to 17 Medical Records departments. 64 questionnaires were distributed among respondents out of which 49 questionnaires were completed and returned back. Results indicated that majority of faculty members (40.81%) believed that use of IT improves the utilization of paper documents. About a quarter (26.5%) believed that use of IT has high impact on medical errors. 36.7% of faculty members considered that IT has a medium impact on self-therapy. The impact of IT on ‘medical research’ and ‘medical education’ was mentioned to be very high by 83.6% and 79.5% of respondents respectively. There was not any correlation between the impact of IT on the studied variables and demographic data of participants such as age, gender and the years of teaching. Results indicated that most of faculty members of Medical Record departments have a high knowledge about the impact of IT on development of health management, research and education in medical sciences, but their knowledge about effectiveness of IT on health quality services and its adverse effect was not proper. Researchers recommended that Medical Record faculty members’ knowledge related to IT should be increased through educational courses and training.
Siamian (170, 2005) carried out a research entitled "A Survey on Mazandaran Medical Science University Faculty Members: Attitudes, Skills and Use of Computer and Internet in Their Teaching and Research Activities". The study was conducted to assess faculty members’ attitudes, skills and performances in using computer and the Internet in their teaching and research activities. The survey was done based on cross sectional study. A questionnaire, including 3 dimensions of attitude, skill and usage was used to collect data from 124 faculty members in five faculties of Medicine, Health, Pharmacy, Nursing and Midwifery and Paramedical Science. Results indicated that 124 (58.2%) of faculty members of all the five under study faculties participated in the study. 38.7% of respondents were in ‘good’ skill level followed by 29 % ‘excellent’, 15.3 % ‘average’ and 11.3% ‘poor’. Regarding the attitudes, 58.9% of respondents were in ‘excellent’ level and 26.6% ‘good’. 49.9% of respondents used ‘computer’ 10 to 15 hours weekly and 33.9% used the ‘Internet’ 60 hours monthly. Most of faculty members had positive attitude towards computer and the Internet in medical education, but few of them did not enough knowledge and skill. Researcher recommended that faculty members’ skills and performances in use of computer and Internet for research and teaching activities should be promoted. It has been further recommended to provide workshops based on the needs of faculty members.

Asefzadeh and Rafati (9, 2006) carried out a research on “How to Update Physicians and Dentists’ Education after Graduation”. They wanted to assess the extent of using the Internet among physicians and dentists in Qazvin Medical University. They maintain that use of the Internet and other e-sources for professional updating among physicians and dentists which are very essential for improving Continuing Medical Education (CME). Descriptive study was used for research method and questionnaires were distributed randomly to physicians and dentists in Qazvin Medical University. Results showed that all 339 of the samples answered the questionnaire, which included 52.8% general physician, 2.1% residents, 8.26% specialist, 2.8% fellows, 11.9% general dentists and 3.6% dental specialist. The best sources of CME was indicated to be 69.7% reading books,
24.6% using Internet and e-mail, 28.1% reading foreign journals and 26.8% participating in seminars and workshops. Comparing the two groups, it was made clear that physicians and dentists on average spent 14 hours and 19 hours of studying per month respectively. 45.8% of those who didn't use the Internet stated that they had not access to the Internet and 40% did not know how to use the Internet. Respondents stated that they allocated 5 hours for study weekly, 9 hours for teaching, 2.5 for doing research works, 4 hours for meetings and participations and 35 hours for medical visits. Since the Internet plays an increasingly important role in physicians professional updating, it is recommended that the Internet training courses be offered to physicians. It is suggested to provide more hardware and software facilities at hospitals and libraries. Ongoing Medical Education should be provided at universities. Electronic libraries with the latest medical information are crucial for physicians.