REVIEW OF LITERATURE
CHAPTER - 2

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2.1 Introduction

The review of literature is an essential component of any research investigation, which gives necessary input to the investigators to frame the research study on a chosen topic.

Changes in technology in recent years have dramatically altered how information is accessed, stored and disseminated. Whereas information provision in academic libraries or special libraries was previously based upon the collection of physical library materials, it is now increasingly the case that libraries are moving their collections into the virtual arena. With advances in new technology opening up access to information on a local, regional, national and international basis, academic community are now faced with a multitude of information sources available from their desktops. The explosive growth of internet and widespread use of computer networks accelerated the use of electronic information sources to a great extent. The use of databases, electronic journals and other electronic information sources has increased significantly.

The consequences of these changes have had a dramatic affect on the way that teaching, learning and research are carried out in higher education. As change has been so dramatic, this raises important questions as to whether academic communities are fully aware of the potential of the new technologies and have the skills to fully utilize them in their work. In particular, academic community requires new skills and competencies to navigate, find, evaluate and use Electronic Information Sources (EIS). As EIS become more central to the information
It is only in the last decade that academic libraries have begun to assess levels of use of EIS and to explore the human responses and cultural changes that such rapid change is bound to inflict, most notably through the IMPEL2 project (The Impact on People of Electronic Libraries) and the JISC (The Joint Information Systems Committee) funded JUBILEE (JISC User Behavior in Information Seeking. Longitudinal Evaluation of Electronic Information Services) project.

A review of the literature found little that specifically looked at Fisheries Sciences academic community and their information use. Also, the studies conducted globally have revealed that most of the overseas universities have comprehensive science and humanities academic programmes and there is no university devoted exclusively for Fisheries Sciences. However, there are a few institutes which deal with Marine Sciences education and research activities under some universities. The researcher has identified some important studies on the use of electronic information sources by students, faculty and research staff covering various profession, different disciplines in universities and institutes of higher education. It is, therefore, felt appropriate to have an overview of these studies. In this chapter, an attempt has been made to give a broad overview of research methods and procedures used by earlier workers in this area and point briefly to the findings of related studies on use of electronic information sources.

2.2 Use of CD-ROMS

Since CD-ROM database products first emerged in academic libraries in 1986, they have proliferated and so too have studies investigating this technology. However, literature review revealed that most articles on CD-ROM use are limited
in scope, focusing on a single database or a single issue and involve only a limited population of users

Brueggeman (1988) reported on a year’s usage of an earlier version of Aquatic Sciences and Fisheries Abstracts (ASFA) at the Scripps Institute of Oceanography library. The date and log on/log off time corresponding to public-access usage of ASFA compact disk was gathered. The data reflected usage during the first year of ASFA compact disk availability at the library and from the data, the number and length of ASFA compact disk search sessions along with the median search session length was calculated. Quantification provided some gross measures and indications of ASFA compact disk usage that were of interest for marine science libraries offering or considering purchase of ASFA compact disks. His later study (1988) described local software modifications, search methods, and use patterns of the Scripps community. He concluded that users consulted the CD-ROM for informal inquiries, and those who spent more time searching preferred the command language mode, over the menu system. Their fee-based online search service was not affected, and the print version was often recommended for some approaches to the literature.

In an academic health science library, Glitz (1988) investigated the use of MEDLARS ONLINE (MEDLINE) on CD-ROM when an early version was introduced. The study sought search experience and search strategies employed in CD-ROM use. About half of those surveyed indicated that they were satisfied with the results, a third was not satisfied. Most agreed that they would use the disk again.

Sieburth and Barnett (1991) conducted a survey to examine the impact of CD-ROM bibliographic database, Aquatic Sciences and Fisheries Abstracts (ASFA), which was newly introduced in a Marine Science library. They wanted to
investigate its acceptance by the researchers who were accustomed to using printed sources in the library, effect that the CD-ROM would have on online fee-based searching and whether the printed ASFA could be discontinued. Two-thirds of the CD-ROM users were satisfied with the search results, and all expected to use the disk in the future. Responses to the survey questions confirmed that convenience and ease of use were important factors in its success. Contrary to other studies, the researchers were not concerned about currency, but were interested in access to older materials. The investigators opined that the introduction of the first CD-ROM bibliographic database in a library changed the familiar environment. It was obvious from the experience at the library that in a research environment, patrons quickly took advantage of new and more efficient methods of finding information they needed.

Fuseler and others (1993) in their study details a comparison of the coverage, retrieval methods and indexing of fisheries literature in the major fisheries CD-ROM databases, including Waves, Aquatic Sciences and Fisheries Abstracts, Wildlife and Fisheries Worldwide, Selected Water Resources Abstracts. The study of coverage included an assessment of overlap, uniqueness, currency and journal coverage. The study of retrieval methods documented the most efficient ways to use the databases and indexing between databases was also examined.

A quantitative study was undertaken at James Cook University library, Queensland by Dalton and Dartnall (1994) to find out how students and staff made use of CD-ROM databases to locate information. Researchers felt that a half hour limit on search time, accompanied by support from a variety of teaching tools and programs, was an effective method of monitoring the service.
Fuseler and Markham (1994) compared major relevant CD-ROM databases ASFA, Agricola, Biological Abstracts, Commonwealth Agricultural Bureaux (CAB) Abstracts, Fish and Fisheries Worldwide and Zoological Record, as tools for finding fisheries literature. From the study it appeared that there was no one definitive database for all of fisheries. It appears that with selective purchasing one could meet the needs of most of one's researchers with 2 or 3 databases. They were of the opinion that more the information specialists know about the individual databases the better they will be able to meet the needs of the users.

Nasir (1996) conducted a study to determine the extent and ease of use of CD-ROM databases by Malaysian postgraduate students in Leeds, UK. Results showed that only 58.3 percent of the students used CD-ROM databases. The users found CD-ROM databases useful for their thesis preparation, writing research papers, articles, and books. The majority of that group wished that the CD-ROM databases could be introduced to their organizations' libraries and information centers in Malaysia. The remaining 41.7 percent did not use CD-ROM databases for a variety of reasons, including, ignorance about their existence or techniques of use; easy access to online searching facilities, and non-availability of databases at the workplace. It was recommended that efforts should be made by university libraries to promote their CD-ROM services in a way that would also attract non-users. Non-users should be made aware of the availability of CD-ROM databases and other information sources.

McCarthy and others (1997) in their study identified the students' preferences and effectiveness using CD-ROMs and assessed the whole CD-ROM environment at the University of Rhode Island. A questionnaire was used to ask students their preferences, confidence levels, skills, and their satisfaction with CD-
ROM services. Analyses of the data revealed that users were satisfied and preferred CD-ROM databases to the print indices.

Majid (1998)\(^{10}\) in his study explored the management of CD-ROM service in Malaysian academic libraries and marketing strategies used to popularize it. The study revealed that the libraries used a variety of marketing and promotional channels, some of which needed improvement. Proper management and promotion of CD-ROM service was desirable to make it more popular and cost-effective for developing countries. Similarly, Malaysian academic libraries need to strengthen their end-user education programs to suit users with different levels of computing and information retrieval skills. This paper also suggested several measures for enhancing the use of CD-ROM service in Malaysian academic libraries.

Oduwole (2000)\(^{11}\) investigated the use of CD-ROM databases in academic libraries in Nigeria. The impact of CD-ROM databases on library development in these libraries was discussed. Results of a questionnaire survey, involving ten academic libraries in Nigeria, identified from preliminary studies found that the most popular bibliographic databases were AGRIS and CAB Abstracts. High cost of subscriptions to CD-ROM databases was ranked highest as the major constraints to CD-ROM use.

Adio (2002)\(^{12}\) carried out a survey to gather data on the problems of CD-ROM in university libraries and their effect on information services. Issues involved centre on the management of CD-ROM in libraries, location of CD-ROM workstations, usage/search intermediaries, training, impact of CD-ROM on library services, provision of access to citation from CD-ROM searches and funding. The questionnaire was used for this survey along with personal observations to confirm and elicit further information on the data obtained through the questionnaire. The study was limited to only two Nigerian university libraries, Kenneth Dike library.
at the University of Ibadan and University of Ilorin library which had fully established CD-ROM services. It was evident from the responses that CD-ROMs usage was ‘very high’. The location of CD-ROM workstation was considered important because it could make a difference in the quality and kinds of queries received. The results of the study further displayed that training of professional staff in the use of CD-ROM was essential.

Oduwole and Sowole (2006) examined the utilization of the Essential Electronic Agricultural Library database (TEEAL) at the University of Agriculture Library, Abeokuta, Nigeria. Data collection was by questionnaire following a purposive sampling technique. A total of 104 out of 150 (69.3 percent) responses were received and analyzed. Postgraduates and final year undergraduates were the major users of the TEEAL database. The study also revealed that though most of the users were computer literate, they still sought the assistance of library staff for database searching. Major constraints to the use of the TEEAL database include the high cost of printing of selected papers and the limited number of workstations. The study recommended for increase in the number of workstations, the cost of printouts should be subsidized by the university and more library staff should be trained in ICT.

2.3 Use of Internet

He and Jacobson (1996) at State University of New York at Albany surveyed 96 patrons in a 2-month period regarding their Internet usage. Gender, college status, and prior experience were sources of differences in searching and browsing behavior and in attitudes toward Internet usefulness. They recommended that libraries should actively create new Internet access points and provide individualized training.
Kammer (1997)\textsuperscript{15} surveyed the faculty members from a college in a major university to explore the possible relationship between Internet usage and the following dependent variables: computer usage (length of time and perceived expertise), length of time of Internet use, perceived expertise of Internet use, and perceived utility of the Internet. Ninety-seven percent of faculty members had an Internet account. Furthermore, computer literacy and the time one had used computers were correlated with computer literacy and with Internet usage, and Internet use was correlated with perceived Internet expertise but not with the length of time the faculty member had used the Internet. It was concluded that highly skilled computer users were more likely to use the network in a more intensive way and have higher appreciation of the network's potential.

Bruce (1998)\textsuperscript{16} in his research focused on how satisfied Australian academics were when they used the Internet to search for information. The significant methodological outcome of the research was its validation of magnitude estimates of user satisfaction with information seeking on the Internet. Testing the validity and reliability of magnitude estimation as a technique for gathering and analyzing interval data on satisfaction with information seeking was the key to the investigation. Data for user satisfaction were then associated with end-user characteristics like training, frequency of use, and expectation of success. The study found that Australian academics generally had a high expectation of success when they were engaged in information seeking on the Internet, and were satisfied with the process regardless of how frequently they used the network or whether or not they had received formal training.

Perry and others (1998)\textsuperscript{17} in their study sought to determine if differences existed among various age groups regarding students' use of the Internet. Surveys were administered to 548 students from three regional universities in the southeastern USA. Survey responses were then analyzed and found that 42.4% to
50% students used the Internet on a regular basis. Ninety percent of the students in the age group of 20-21 year olds and 71% for 24-25 year olds used the Internet for E-Mail. Information was also tabulated for use of the Internet to obtain university information, and for the number of students who had home pages. A large portion of the students indicated that they did not consider the Internet to be a passing fad. Additionally, a little difference was found among the various age groups regarding their predictions for Internet use in the future.

Bao (1998) conducted a survey at the Seton Hall University to collect data and analyze user satisfaction with information services provided through the World Wide Web. Seton Hall faculty and students completed 786 questionnaires. About 80 percent of the respondents reported that they used the Web on a daily or weekly basis. The results revealed valuable information about the Internet users' search strategies, their levels of satisfaction in using the Web and also the major problems encountered by users while searching the internet. The problems encountered by Internet users were, they did not find the information needed, full text information could not be cited and too many hits. Analysis of the data suggests three challenges for the librarians. The challenges were to raise the users' level of satisfaction, to find ways to assist students and faculty in their use of Internet and to provide effective Internet search training.

Voorbij (1999) in his study examined the use and perceived importance of the Internet amongst students and academics in the Netherlands. A detailed questionnaire was distributed among 1,000 members of the academic community and three focus group interviews were held with faculty members. Among other findings, the study revealed that searching the World Wide Web (WWW) is not without difficulty. It was suggested that the libraries should support the users by performing traditional tasks, such as selection, bibliographical description, controlled subject indexing, current awareness, courses, and individual assistance.
The WWW was being used primarily to search general, factual, ephemeral, or very specific information. Full text resources played only a minor role in the academic research process. It was concluded that though the Internet might have conquered a place for itself, it had not pushed aside traditional printed and other information resources.

Adika (2003) conducted a study in order to investigate Internet use among faculty of the three older universities in Ghana. All the three older universities in Ghana were linked to the Internet and the study was conducted with the assumption that since the faculty had access to the Internet and therefore, access to current information through the WWW, the objectives of the study were to investigate, the level of awareness among faculty of the Internet and its services, the access faculty had to Internet; the level of Internet use among faculty and the Internet services used and the impact of Internet on the use of up-to-date information by faculty. Results showed that in spite of the benefits of the Internet, its use among faculty was still very low. The main reasons for this were lack of access to the Internet and the need for training. The investigators opined that the university authorities needed to take immediate steps to provide general access points for faculty through computer laboratories.

Hong (2003) in his study investigated the success of a technology and Internet-enriched teaching and learning environment in molding positive attitudes among students towards using the Internet for learning at a university in Malaysia. Students were provided with computer facilities, required to complete two compulsory generic courses in information technology, and the lectures actively encouraged the use of information technology, in particular, the Internet in the teaching and learning processes. Results from the study indicated that students had positive attitudes towards using the Internet as a learning tool, adequate basic knowledge of the Internet and viewed the learning environment as supportive of
using the Internet for learning. Students with better basic Internet skills and those who viewed the learning environment as promoting the use of Internet favored using the Internet for learning. The university achieved its objectives of promoting the use of Internet for teaching and learning purposes.

Nyika (2003) argued that lack of access to current materials in libraries of universities and research institutions in developing countries was a major problem that hindered research and teaching. Also, document delivery project had not solved this problem. But the Internet made it possible for users to have access to electronic publications irrespective of their geographical location. The two government universities in Tanzania were all linked to the Internet and had access to electronic publications. Nyika’s assumption was that their faculty had access to current information through the Internet. But research results showed that in spite of the benefits of the Internet and access to electronic publications, its use among faculty was still very low.

Ajuwon (2003) assessed the use of computer and Internet by first year clinical and nursing students of the University College Hospital, Ibadan, Nigeria. Overall, 42.6% of the entire sample used the computer. While more than half (58%) of the medical students were computer literate, majority (75%) of the student nurses were not computer literate. Slightly more than two thirds (60.7%) of the entire students used the Internet. E-Mail was the most popular of the Internet services used by the students and cyber café was the common place for the students to access these services. Increased funding for purchase of computers in universities and introduction of computer education into existing medical and nursing curricular were recommended.

Ehikhamenor (2003) in his study explored the impact of the Internet on the scientific communication process and the productivity of the scientists in
Nigerian Universities. It was expected that, besides the direct contribution of the Internet to research through vast stores of scientific information, the Internet would increase the number of colleagues a scientist communicates with on a regular basis and consequently stimulate higher productivity. The results showed that while there was a correlation between the numbers of contacts maintained by the scientists and their productivity, the Internet contributed a little to increasing those contacts or improving productivity.

Oduwole (2004)²⁵ carried out a study to examine the utilization of Internet facilities, its impact on the research outputs of agricultural scientists, and the problems encountered while using the Internet at the University of Agriculture, Abeokuta, Nigeria during 2001/2002 academic session. To elicit the necessary information, 210 questionnaires were administered to the entire academic and research staff of the university. Out of the 210 copies administered, 147 copies were completed and were useful for the study, which constituted 70% response. The results from the analysis of the responses showed that about half (54 percent) of the agricultural researchers at the university use the Yahoo search engine and that they spend an average one hour per day browsing the Internet. The study also revealed that respondents used the Internet to find research materials such as journals and conference proceedings, followed by sending and receiving of E-Mails. The study concluded that the use of the Internet for academic research by agricultural scientists had improved their research output.

Nyamboga and others (2004)²⁶ reported about their findings of a study undertaken in late 2003, which aimed at identifying how far the use of Internet had enhanced teaching, research and scholarly communication at Egerton University. The study involved students, faculty members and library staff. It was found that all the respondents were familiar with the Internet. It was also found that only 205 (85.42%) out of 240 library users had the necessary skills to use the Internet.
without much help from the library supporting staff. Majority of the users learnt to use the Internet through self-study and closely followed by assistance from colleagues. E-Mail and search engines were found to be most frequently used resources and tools of Internet. The investigators found that there was a strong need for information literacy and marketing of the modern library services which lacked at the university library.

2.4 Studies on use of Electronic Information Sources

There are studies that have examined the academic community's use of more than one type of Electronic Information Sources; like the OPAC (Online Public Access Catalogue), CD-ROMs, Internet resources, E-Books, E-Journals, and other electronic databases. A number of studies have been carried out on the use of electronic resources by students, faculty and research staff of institutions of higher learning.

Adams and Bonk (1995) report about the survey conducted at the SUNY University Center Libraries. With support provided by a grant from the Council on Library Resources, the SUNY University Center Libraries conducted a four-campus survey of faculty use of electronic information technologies and resources. The survey and analysis were the first such study including all academic disciplines and a broad range of faculty at several institutions joined in a consortia relationship. The survey's objectives were to determine; the availability to faculty of equipment and network connections necessary for access to electronic information resources, to measure use and frequency of use of these resources, to report locations from which faculty access electronic information and to elicit faculty perceptions of obstacles to the use of electronic technologies and library services which might stimulate use of such resources. The findings reveal that there were inequities in access to electronic technologies among the disciplines.
that the most common obstacle to use of electronic information for faculty was lack of knowledge about resources, and that there exists strong interest in initiating various library transactions via E-Mail or a campus wide information system. The survey results presented clear mandates related to information services, training, the allocation of funds for networking, and access to EIS for libraries.

Diouf (1995)\textsuperscript{28} conducted a survey of the researchers and other users of the library. The survey was conducted to study the different problems encountered in the access to information. The different information sources used by teachers, researchers and students were scientific reviews, colleagues, ASFA and current contents CD-ROMs. The different information sources used scientific reviews, colleagues, ASFA and current contents CD-ROMs. The main problems faced by users were due to the increasing price of books and periodicals which made it difficult to obtain documents needed by users; high postal rates; declining library budget were obstacles to gain access to required information; except ASFA, there was no access to any other international database in the field of Fisheries and Oceanography.

Noble and Coughlin (1997)\textsuperscript{29} investigated the patterns of research and information seeking practices of chemists in Canadian universities. The purpose was to obtain a better understanding of academic chemists' information needs, preferences and practices; their experience with new information technologies; and their perception of the university libraries' capacity to meet these information needs. Regarding the chemists' familiarity with electronic equipment and access to resources, 99% had computers, 89% had access to communication software and 87% were connected to campus network. Chemists were self taught (78%) and also learned about computers and information technology from colleagues (70%). Some 22% indicated they have received some information via the library. But only 17% have received help from computing services departments at their universities.
Regarding the use of electronic information resources, 40% used the campus online catalogue at least weekly, databases and indexes available on the campus network were used by 60% and only 25% regularly used databases on CD-ROM in the library. A considerable number of chemists considered their knowledge to use the Internet and WWW moderate to good, 41% and 37% respectively. Lack of information about the resources available in the library was one of the greater impediments in the use of the resources.

Ray and Day (1998) reviewed the studies undertaken to determine the level of use of the electronic resources and how students felt about various issues surrounding electronic resources. 155 students were questioned as part of a larger study IMPEL2, investigating the Impact on People of Electronic Libraries, supplemented by 162 students, questioned as part of an MA Dissertation using the same methodology. It was found that the most popular electronic resources were CD-ROMs and the Internet, with 80.7% and 76.7% respectively. The findings of this small sample population suggested that many respondents used some electronic resources and were aware of their benefits, majority liked to use print materials to complement this technology. Limited time and lack of effective information retrieval skills formed the major barriers in the use of electronic resources. Conversely, faster access to information was the main advantage of electronic resources. About 60.3% of respondents felt they could acquire significant information from the Internet and most students acquired the skills necessary to exploit the electronic resources via trial and error or through guidance from other students.

Using an essential element from the theory of the diffusion of innovations (that individuals adopt innovations at different rates), Starkweather and Wallin (1999) conducted a series of focus group sessions and personal interviews with university faculty, to discover their attitudes regarding the computer-based
information resources that academic libraries provided to meet their information needs. The study explored the differences between the level of adoption of information resources by selected faculty and their responses to these technologies, the impact of library technology on the way they used the library for research and teaching, and their interpretation of the role the library plays in the period of transition and change.

Zhang (1999) conducted a study to construct a baseline of scholarly use of Internet-based electronic resources (e-sources) by surveying a group of library and information science (LIS) scholars. Results reported about the researcher’s demographic information, frequency of use of various Internet tools and applications, strategies of locating e-resources for research, opinion on citing e-sources and evaluation of e-sources. E-sources had been extensively used as part of research process and also there were a number of obstacles to using e-sources for research. The major problems and concerns identified included organization, quality, reliability and stability of e-sources, access to e-sources in special formats; standards on regulating e-sources for research purpose; and social norms regarding using, accepting, citing, publishing and evaluating e-sources.

Crawford and Daye (2000) in their study described the use of the electronic information floor (EIF) located in Glasgow Caledonian University’s Caledonian library and information center. The survey used both observational and questionnaire based methods and builds on a previous study which used focus groups and semi-structured interviews. The study was divided into two parts: an observational study and a questionnaire based study. The observational study found word processing, sending and receiving E-Mail and web browsing to be the most common activities. The main findings were that only 18% used CD-ROMs and 13% used online databases. About a third had problem in using the EIF.
Weingart and Anderson (2000) conducted a mail survey to investigate the electronic database awareness and use by 856 Utah State University (USU) administrators and teaching faculty. The responses revealed the need for greater publicity regarding new acquisitions, training opportunities, and methods of remote access. Unexpectedly, the survey itself, with its accompanying descriptions of available electronic databases and access methods, served to meet many of the needs it identified.

Jimba and Atinmo (2000) examined the relationship between accessibility to information technology and research publications among users of agricultural libraries in Nigeria. A self-constructed questionnaire, which had a reliability coefficient of 0.90, was used to collect data. A total of 150 questionnaires were distributed, and a response rate of 78.7% was obtained. A list of ten major agricultural research institutes in Nigeria was derived, and a preliminary investigative inquiry was sent to them to indicate if they had installed various electronic information resources which included E-Mail, CD-ROM, and full internet services into their library operations. From the responses received, five institutes were selected for the study. A survey research method was adopted for this study. Data was analyzed using the Pearson product moment correlation coefficient and the student t-test. By observing the mean accessibility scores of each format, it was found that E-Mail, CD-ROM, facsimile, and telephone had mean scores above the median of three. However, a low accessibility mean score was noticed with the full Internet access among the respondents. Results showed that there was no significant association between accessibility to electronic formats and research publications of the respondents. It was recommended that the government must make it a matter of top priority to develop an information culture amongst the broadest sectors of the society as is possible. These recommendations could be achieved by proper formulation of information policies by governments in the developing world.
The proliferation of electronic resources has had a significant impact on the way the academic community uses stores and preserves information. Heterick (2002) reports about the anonymous survey conducted by JSTOR at higher education institutions in the United States (US) during 2000 to fully understand the effect of this technology on the behavior and attitudes of academic professionals. The main objectives of the study were: i) to find out how U.S. academics perceive and use electronic resources for research and ii) to learn about their attitudes regarding the current and future impact of technology on their use of the library. Over 60 percent of the faculty responded that they were comfortable using electronic resources. They believed that a variety of electronic resources were important to their research and considered electronic databases to be invaluable. Also, 62 percent expected that they would become increasingly dependent on electronic resources in the future. The resources used most often were online catalogs, full-text electronic journal databases, abstracting and indexing databases.

The awareness of the existence of agricultural databases, library sources, and Internet facilities were examined by Oladele (2002), among the researchers who were randomly selected from all over Nigeria. The result showed a little awareness and a little patronage of agriculture databases among those who were aware. The study also considered the independent variable to isolate variables and explained the information seeking behavior of the researchers. The result indicated that majority of the researchers were aware of almost all the electronic communication tools except World Wide Web and E-mail. As low as 25.1% and 39.7% of the researchers indicated their awareness of WWW and E-Mail. However, a high percentage (62.5%) of the researchers never indicated whether or not they were aware of the WWW. The low awareness of WWW and E-Mail observed among researcher probably indicated that those tools had not been made common and accessible to the use of the researchers. The findings showed that
small proportions of the researchers were involved in the use of modern electronic communication tools such as E-mail, WWW and Internet when seeking for information. This result was perhaps due to the fact that researchers were not motivated by their conditions of work to keep themselves abreast of current information in their field. The policy implication of the findings was to improve the performance of agricultural researchers through the provision of information sources as well as the facilities to enhance their use as recommended in these research institutes. Specific training needs of the researchers to seek for appropriate information from different sources were also recommended.

In order to determine the biomedical and electronic journal use pattern and to understand the user characteristics, De Groote and Dorsch (2003) conducted a survey among all the faculty, residents and students at the library of the health sciences-Peoria, University of Illinois, Chicago. The study assessed the use of online journals, print journals, databases, computer literacy levels and other library user characteristics. 41% of the health professionals responded to the survey. 53% of the respondents indicated that they searched MEDLINE at least once in a week. The other databases showed a much lower usage. Overall 71% of the respondents indicated a preference for electronic to print journals. The study findings suggested that databases without links from bibliographic databases will have lower use.

Oduwole and Akpati (2003) carried out a survey of the use of electronic information by students, academic staff, administrative personnel and the public at the University of Agriculture library, Abeokuta using a questionnaire. The questionnaire sought information on the use of OPAC, CD-ROM databases available in the library and problems identified by users militating against the use of these automated services. Majority of the users were satisfied with the information obtained and reported that they found these automated services easy.
to use The researchers concluded that the users’ accessibility to electronic databases had increased the awareness of value of information and assisted the nation in scientific and technological advancement.

Kadzamira and others (2003)\textsuperscript{40} reviewed the Fisheries information resources required at a number of institutions which offered courses in Aquaculture and Fisheries sciences in Malawi, for effective Aquaculture and Fisheries management in terms of teaching, conducting research and transmitting the results of research to all of the stakeholders involved. Further more, the project aimed at assessing the information resources and needs of Fisheries institutions, also proposed mechanisms for improved access to Fisheries and Aquaculture information and documentation. The survey results indicated that the researchers, lecturers and students used various types of information resources such as printed books, journals, CD-ROMs, grey literature and Internet. The use of Internet was to access information using search engines, browsing various Fisheries institutional websites, news groups and for sending E-Mails. E-Mails were preferred because they were cheap and fast to use. Though the respondents realized that Internet was a source of great deal of information, it was found that there was a low usage because of high Internet costs and low bandwidth. It was found that Aquatic Biology, Aquaculture & Fisheries Resources (ABAFR), The Essential Electronic Agricultural Library Database (TEEAL) and Fish Base were heavily used in academic institutions. The low usage of CD-ROMs was found in government institutions because some institutions did not have the necessary equipment to read them (computer and CD drives). The other reason for users stating a preference to printed books and journals was that the CD-ROM databases provided bibliographic references only and not full text documents. It was suggested, training users in information searching skills, providing access to Internet with fast connections; subscription of more Fisheries journals; employing qualified librarians and establishment of a network for all Fisheries institutions in Malawi.
A questionnaire-based survey of health professionals affiliated with three teaching faculties of Kuwait University was conducted by Rehman and Ramzy (2004)\textsuperscript{41} to find out the nature and extent of use and the reasons of low use of the electronic information resources available at the Health Sciences Center Library. Responses were received from 70.9 percent of the faculty members. They reported that time constraints, lack of awareness, and low skill levels were among the primary constraints they experienced.

Agaba and others (2004)\textsuperscript{42} investigated the utilization of electronic information resources by the academic staff of Makerere University in Uganda. They examined the academic staff awareness of the resources available, the types of resources provided by the Makerere University Library, the factors affecting resource utilization. The study was both qualitative and quantitative employing questionnaire, interview and content analysis methods. The findings revealed that the University library provided electronic information resources and that most academic staff was aware of their availability, but did not utilize them. Furthermore, a number of factors affected electronic information resources' utilization. The study concluded that despite a number of problems that inhibited utilization of e-resources, a limited number of academic staff actually use electronic information resources. It was recommended for enhancement of Information and Communication Technology Network or Bandwidth, provision of adequate Information and Communication Technologies, decentralization of service provision and increased marketing strategies.

Ibrahim (2004)\textsuperscript{43} surveyed the faculty members at the United Arab Emirates University to measure their use and perception of electronic resources. Questionnaires were sent to a sample of 140 faculty members. Responses were received from 125 (89%) faculty members. Analysis confirmed that frequency of use of electronic resources was low. Significant low usage was reported for E-
books, bibliographic databases and E-journals. Reasons cited were lack of time because of the time needed to focus on teaching, lack of awareness to electronic resources provided by the library, ineffective communication channels and language barriers.

Renwick (2005) conducted a study with the objective to determine faculty's knowledge of electronic resources, access to a computer, use of electronic resources (both number and frequency) available at the Medical Sciences Library (MSL), and the areas of training needed and to identify areas for further research. A survey questionnaire was administered to faculty in medicine, pharmacy, dentistry, and veterinary sciences at the University of the West Indies. The questions covered computer literacy, computer access and location, knowledge and use of electronic resources, and training needs. The response rate was 70 per cent, of whom 97 per cent were computer users. Seventy three per cent used computers daily, and 82 per cent felt that their computer literacy level was average or beyond. Overall, it was found that faculty had high awareness of the electronic resources made available by the MSL but low use of MSL-specific resources supporting the suggested problem of underutilization. Many respondents felt that e-resources were important. Although many were competent users, 83 per cent were self-taught and majority still expressed a need for training. It was recommended that there be greater promotion of the library's e-resources.

In order to investigate the use of electronic resources by students and faculty of Ashesi University, Ghana, Dadzie (2005) conducted a questionnaire-based survey. It consisted of 16 questions to determine level of use, type of information accessed, assessment of library's communication tools, problems encountered when using electronic resources and ways to improve the provision of electronic information in the university. The questionnaire was distributed to all students, faculty and administrative staff in order to reduce the
generalization of the results The students were made up of four year groups categorized as YearGroupA, YearGroupB, YearGroupC, YearGroupD. A total of 169 questionnaires were therefore distributed and 141 completed questionnaires were returned, giving an overall response rate of 83 per cent. The study found that general computer usage for information access was high because of the University's state-of-the-art IT infrastructure. Usages of some internet resources were also very high, whilst the use of scholarly databases was quite low. The low patronage was attributed to inadequate information about the existence of these library resources. The study recommends the introduction of information competency across the curriculum and/or the introduction of a one-unit course to be taught at all levels and the provision of more PCs on campus.

2.5 Use of EIS in Relation to Other Sources of Information

Students, teachers/scientists and researchers now use a variety of information sources for satisfying their information needs in the Fisheries Institutions. Electronic Information Sources are one type of the many information sources available to the academic users in the recent years. The other information sources which are identified as potentially useful to the academic community of Fisheries institutions are the experts/colleagues and printed sources like books, journals, workshop/conference proceedings, theses, research reports etc.

Various studies have investigated about the rank orderings of the preferred information sources by the faculty, researchers and students in higher educational institutions.

Verhoeven (1995) reported that family physicians used primarily colleagues followed by books and journals as information sources for patient care. They rarely used electronic information sources.
Mehta and Young (1996) surveyed the science and engineering faculty at the University of Alabama about their use of electronic resources to answer their scientific and technical information needs. Results indicated that although the users had some familiarity with electronic products, they still were inclined to use print sources or informal channels to get the needed information.

Bell (1997) examined the impact of electronic information on the academic research community. In early 1996 the University of Wales, Cardiff conducted a survey of the information needs of its researchers. The survey established that printed material from the university libraries was one of the most important sources of information for research, along with contacts with other researchers. Staff anticipated that electronic publications would become more important over the next few years, but they did not see the importance of printed material diminishing. A literature review was carried out to discover whether published studies of the impact of electronic information were consistent with the findings of the internal survey. The review found that attitudes to electronic sources were generally positive, but printed sources of information were preferred by most academics contributing to published studies.

The information seeking behavior of astronomers, chemists, mathematicians and physicists was assessed by Brown (1999) at the University of Oklahoma, Norman. The results of the survey indicated that all of the scientists surveyed relied greatly on the journal literature to support their research activities, with the mathematicians surveyed indicating an additional reliance on monographs, preprints, and attendance at conferences and personal communication to support their research activities. Despite an expression by the scientists for more electronic services, the majority preferred access to journal articles in a print, rather than an electronic form.
Several other research studies similar to the above that were conducted by Melgoza and others (2002), Majid and Tan (2002), Dilevko and Gottlieb (2002), Sembenberg and others (2004), and Tenopir and others (2004) have also reported the academic community's preference for printed sources over electronic sources.

Despite the widespread availability of the Electronic Information Sources, the very recent research studies also indicate that the academic community still depends on traditional sources of information for their academic pursuits.

Muswazi (2005) in his study at the University of Swaziland Library assessed user involvement in print/electronic resources. The respondents involved in the questionnaire survey were asked to indicate, in rank order, their use preferences from a selection of print materials, CD-ROM and Internet databases and resources, and audio-visuals. Most of the respondents 144 (92.9%) gave first preference to print materials, 40 (28%) of these respondents clearly stated that they used only this format. Audio-visuals and Internet resources were the second and third choices (43.4% and 42.6% respectively). A majority of 94.4% of the respondents indicated that CD-ROM databases would be their last resort. The findings of this study have revealed the respondents' preference to printed sources of information.

Asemi (2005) also argued that students still depend on print media for searching the relevant information for their research activities and that the electronic media had not replaced print media.

Similarly Korobili and others (2006) in their study found that great majority of the faculty of Technological Educational Institute of Thessaloniki,
Greece used printed sources to a greater extent than electronic sources. They made most use of printed books and journals.

2.6 Factors affecting the use of EIS

A number of factors are affecting the use of Electronic Information Sources. The major factors identified in the literature that influence the academic community's use of EIS were age, gender, academic status, subject disciplines, perceived ease of use, previous computer experience, location of computer use for EIS, and experience in the use of EIS.

Jones and others (1991) in Glasgow reported that more medical students than nursing students used the computer and the Internet. Similar findings were reported by Ajuwon (2003) where more medical students than student nurses had used both the computer and the Internet. Lazinger and others (1997) identified that discipline had a major influence on usage patterns and that faculty members in science or agriculture tend to use the Internet more intensively than faculty members of humanities or social sciences. Korobili and others (2006) reported that the use of electronic sources was higher in the School of Business Administration and Economics among those who held a PhD degree and among younger members of the faculty.

The impact of perceived usefulness of electronic sources and convenience of access upon use of electronic sources is considered to be reasonable. Xia (2003) reported that access was one of the important factors influencing the usability of electronic sources and services. Korobili and others (2006) found that the use of electronic sources was positively influenced by the respondents' perceived usefulness of the resources, the convenience of access to the sources and their academic productivity.
A study was investigated by Abels and others (1996)\textsuperscript{64} to explore factors that influence the adoption and use of electronic networks and network services by science and engineering faculty in small universities and colleges. It was found that different actions were needed for enhancing adoption and to increase use of these networks. Pollard (1999)\textsuperscript{65} reported the results of a study comparing the level of use and perceived availability of various library services and electronic information sources before and after installation of the scholar's workstation. The scholar's workstation was installed in a central location at each of four sites where faculty and students were engaged in projects related to environmental studies. Results of the survey indicated that use of several electronic sources and Internet services increased after the users' exposure to the workstations. User perceptions of the availability of electronic information sources also improved.

Waldman (2003)\textsuperscript{66} surveyed students' use of library electronic resources and self-efficacy in their search for information at Baruch College. Students' use of library and computers were analyzed and correlated with their self-efficacy scores. Through statistical analysis, it was found that use of the library correlated to the students' use of the library's electronic resources. It was also found that students who express an interest in learning about the library's electronic resources were more likely to have higher self-efficacy.

Several studies have investigated the relationship between the use of electronic information sources and prior computer knowledge or computer literacy. Majid and Abazova (1999)\textsuperscript{67} in their study found that use of electronic information sources and services was influenced by computing skills of academics. A statistically significant relationship was found between computer literacy and use of electronic information sources. A majority of faculty members with 'very good' and 'excellent' computing skills had been frequently using the EIS. The research by Hewitson (2000)\textsuperscript{68} showed a direct link between EIS use and
perceived IT competency Baruchson-Arbib and Shor (2002)\textsuperscript{69} in their survey examined the students at Ariel College in Israel to determine whether the knowledge of computers influenced EIS use. In response, 50.4\% claimed that they were knowledgeable, 48.9\% said they were not and 0.7\% did not answer. Through T-test analyses, it was found that those with poor knowledge tend to use EIS significantly more than those without prior knowledge Ibrahim (2004)\textsuperscript{70} found that faculty members in the United Arab Emirates University (UAEU) had positive attitudes towards the importance of computer literacy in the use of e-resources. This was the reason for the insignificant influence of computer skills and computer literacy on the low use of e-resources in the UAEU. Korobili and others (2006)\textsuperscript{71} also examined the computer anxiety rating scales which provided evidence that the less anxious the faculty feels about the computers, the more frequent users they become.

The study conducted by Oduwole (2004)\textsuperscript{72} revealed that a greater percentage of scientists in the university accessed the Internet from outside the campus. He reported that an increase in the number of computers with Internet access at the university library would increase the number of users using the Internet. Whereas Adams and Bonk (1995)\textsuperscript{73} reported that more faculties accessed a computer and had an Internet connection at their office than at home. Renwick (2005)\textsuperscript{74} reported that only a small percentage used the library computers and majority of the faculty depended on access to a computer at home. EIS use could be maximized by availability of networked workstations.

Majid and Abazova (1999)\textsuperscript{75} also noted a significant relationship between the age of academics and their use of electronic information sources. It was observed that the faculty members with more than 50 years of age had been less frequently using the EIS. Age played an important role in usage; younger the faculty members were the more they used electronic sources (Bar-han and others
They also found that gender and academic rank had only a minor influence on the usage of e-sources and the Internet.

2.7 Need for Training in the Use of EIS

Before any new technology can be effectively and efficiently utilized those who will be using it have to have the skills to do so. Many studies have identified the need for end users training in the use of electronic information sources.

In the survey conducted by Adams and Bonk (1995), user training was considered by faculty to be a high priority need. The faculty indicated that their use of electronic information resources and technologies would be increased by instruction or training in the use of electronic mail, networks, networked resources, and online databases. There were noteworthy training preferences among faculty in the various disciplines. A merger of workshops and printed manuals/materials was the most preferred training method. Because of the universal need for training on certain systems, such as E-Mail, it was suggested that libraries should work with computer centers to develop training modules that could be offered to all students and faculty.

Libraries spend a large portion of their budget on electronic information systems and products on the OPAC, on CD-ROM networks, on CD-ROM products and networking licenses, on electronic information on diskette, on access to external databases, etc. Lapp (1996) had argued that, it was not enough merely to provide these technologies. In the service era, all products should be offered in combination with integrated services. In order to avoid the frustration of many users by their unsuccessful information retrieval experience, he suggested and developed a user training and services programme at the Julich Research Center's Central library which comprised of the following aspects.
• an introduction to the library,
• online training in the OPAC,
• training on general bibliographic databases and subject-related databases,
• training on how to find relevant information on the internet, and
• an evaluation of these activities

McCarthy and others (1997)\(^79\) also analyzed the CD-ROM user needs to become more effective searcher and the preference for their training methodology. Although students indicated that they were confident of searching, they admitted that they need to know basic search strategies and they needed more personal assistance at the point of need or hands-on workshops.

Bao (1998)\(^80\) in his survey of Internet users at Seton Hall University found that one of the challenges for librarians was to find ways to provide effective Internet search training. The respondents were more interested in learning advanced Internet searching skills followed by basic Internet searching skills and subscription databases.

McCreadie and Rice (1999)\(^81\) opined that when using a more interactive information delivery system, such as an online database, the user must have access to knowledge of resources, select a database that matches both the content and the comprehension level of his or her search, be able to navigate the interface or the command language of the system and understand the nature of the results. Majid and Abazova (1999)\(^82\) reported in their study that a significant relationship existed between computer literacy and use of the electronic information sources and services. Hence they stressed the need of user education programmes in developing basic computing skills among the library users, particularly in developing countries with low computer literacy. End-users with better computing
skills were more likely to benefit from the ever increasing volume of digital information

Applebee and others (2000) reported on the first-ever nationwide quantitative survey of academic staff use of the Internet. The results of the survey included daily use of E-Mail, access to the Internet via remote dial-in services and technical support provided to academics. More than one-third of respondents seemed to be in need of more training in Net use and time limitations and lack of training were typical barriers to effective use.

Adika (2003) also reported that Internet use in Ghana was still very low among the university faculty. The data showed that Internet use was likely to increase when users had access and received training. It was suggested that the expertise of librarians, information professionals and computer scientists need to be tapped to provide training and refresher sessions for faculty to keep up-to-date on harnessing the immense potential of the Internet as a source of information for teaching and research.

Rehman and Ramzy (2004) conclude that users perceived formal training programs and active involvement of librarians were the crucial steps which could facilitate effective use of the electronic resources. The users had also hinted the possible modes the library should be using for making them aware, informed and educated. It was suggested that the library management could evolve strategies in a rational and systematic manner to achieve a higher awareness and skill level by these users who were quite clear about their needs and keen to use these resources in an intelligent way.

Doney and others (2005) conducted a study of general practitioners, practicing nurses and practicing managers in Nottingham and Rotherham, UK, to
assess their usage and need for training on use of the Internet and biomedical databases. The results of the study indicated low usage of the libraries. The lack of training was the most reported barrier to using Internet (67 percent) and databases (52 percent). Overall, 52 percent of the respondents reported wanting Internet training and 64 percent wanted database training. The study identified that the training need, if provided, would increase the use of electronic resources further.

The survey of the medical faculty at the University of West Indies was conducted by Renwick (2005)\textsuperscript{87}. The objective was to determine faculty’s knowledge and use of electronic resources available at the Medical Science Library and to identify the areas of training needed. Noting the limitations of the methods by which faculty had learnt about e-resources, mainly self-taught and from family or friends, meant that comprehensive training was needed. Faculty participated in this study, including those who considered themselves as expert or above average in terms of use, also stated a clear desire of training. The survey provided a concrete information on exactly what was used, what training was needed and in which format it should be. The faculty felt that workshops with a hands-on component, one-on-one demonstrations and support when needed were the preferred formats.

Manda (2005)\textsuperscript{88} argued that training of end users in the use of electronic resources should be one of the central activities in any library so that staff and students could effectively search and utilize these resources, in which institutions and donors have made substantial investments. The findings of this study conducted in ten research and academic institutions in Tanzania, also indicated a positive relationship between training of the faculty in the use of electronic resources and extent of their use. Seventy percent of those who had been trained did use these sources at different levels, whereas 64 percent of those who had not been trained in the use of electronic resources did not use them. It supported the
assumption that training would be the central push factor in the use of electronic resources, though by no means was the only one. It was concluded that there was the lack of well developed comprehensive training packages for specific user groups in the institutions. The study also showed that there was a great diversity of skills and knowledge on electronic resources but this was always not targeted at specific electronic resource use.

Kinengyere (2007) examined the effect information literacy (IL) has had on the usage of electronic information resources in academic and research institutions in Uganda. The study aimed to focus on the innovations that Makerere University Library had undertaken to ensure that library users were trained on how to access a variety of available information sources, evaluate the information and apply it to address their needs. Data were collected for the study using interviews to both library staff and users of the selected institutions: two library staff in charge of e-resources and ten students/researchers were interviewed from each institution. However, user statistics for the year 2004-2005, as well as the information literacy training sessions conducted, were the main sources of information. The study showed that some of the available resources had not been utilized at all. Hence continued IL program was necessary. Kinengyere concluded that information professionals were to pass on IL skills to library users, while library users should endeavor to find out what information was available online for their consumption. The attitudes and perceptions of the users also influenced the level of utilization.

2.8 Indian literature on the use of EIS

Swarnalatha Devi (1997) investigated the information seeking behavior of the agricultural scientists working in various institutions at Manipur. In order to obtain agricultural information, scientists frequently used journals, books,
conference proceedings and technical bulletins. From the analysis of the survey, it was understood that the agricultural information available in the state was not sufficient and enough.

Ramesh Babu and Gopalakrishnan (1998) conducted a survey of Internet use among the professionals in the field of science, technology, and medicine working in various institutions in Chennai, India. The study found that the E-Mail and Web resources were the most frequently used EIS by all the categories of professionals. The use of Internet was more among younger and female professionals.

Shijit (2003) investigated the use of electronic information sources among the medical professionals working in the medical colleges and national level medical institutions in Karnataka. Aspects like use of electronic information sources, purpose of use, barriers faced by the medical professionals while using EIS, factors affecting the use of EIS were analyzed. It was found that prior computer experience was not a pre-requisite for the respondents while beginning to use EIS. E-Mail was the most frequently used EIS followed by Web resources and CD-ROMs. MEDLINE was used frequently by majority of the respondents in addition to government/professional association websites and commercial medical websites. The medical professionals preferred printed sources to electronic sources. It was also evident from the analysis that EIS did not challenge the role of traditional means of information seeking of the respondents. The medical professionals expressed the need for improving skills in the use of EIS. The study recommended for better infrastructure facilities in order to improve the use of electronic information sources at the medical institution libraries.

The study conducted by Varalakshmi (2003) examined the use and perceived importance of the Internet amongst the academics of Andhra University.
The findings revealed that the primary purpose of using the Internet was for research, consulting e-journals was infrequent, Google and Yahoo were the favorite search engines. Among other findings, the study revealed that searching the World Wide Web was not without difficulty and the use of Internet had not replaced the use of printed sources.

Vaishali and Kumar (2004) analyzed the information needs and use patterns of faculty members and research scholars of Amravati University. It was found that the most preferred information sources were the printed sources like books, periodicals, technical reports, conference/seminar proceedings, patents and standards. Internet, e-journals and CD-ROM databases were the least ranked information sources because they were not available in most of the libraries and also due to lack of skills in the use of these electronic sources. Networking of the libraries under study was suggested by the users.

Kumar and Kaur (2005) investigated the use of Internet and related issues among the teachers and students of engineering colleges of Punjab, India. A well structured questionnaire was distributed among the 960 teachers and students of all the engineering colleges of Punjab. The response rate was 84.2 percent. The study demonstrates and elaborates the various aspects of Internet use such as, frequency of Internet use, most frequently used place for Internet use, purpose of use of Internet, use of Internet services, ways to browse the information from Internet, problems faced by the users and satisfaction level of users with the Internet facilities provided in the colleges. Results of the survey indicated that 69.4% use the Internet mainly for educational purposes. Majority (54.3%) of respondents used it for consulting technical reports, for reading e-books on the Internet (42.3%) and consulting e-journals (38.5%). All the Internet users preferred E-Mail facility and the World Wide Web. The common problem faced by majority of the respondents in surfing Internet related to the inordinate delay in...
retrieving relevant information (69.4%) It was also found that Internet had become a vital instrument for teaching, research and learning process of these respondents. Suggestions put forth were to extend the time of Internet services, installing of more computers with latest specifications and multimedia kit. It was also suggested for subscription of more number of electronic journals by the library.

Naushad (2005) examined the use of electronic information services among the users of Indian Institute of Technology, Delhi (IITD). The study analyzed the awareness of electronic information services, use of e-journals, advanced search facilities, purpose of using e-information, the infrastructure facilities available and satisfaction level of users. On the basis of analysis it was found that Boolean operators, truncation and wildcards were the most popular search facilities among the users. Yahoo, Google, Info seeks were the prominent search engines among the users. Lack of printing facilities, trained staff and unfamiliarity with electronic information were the major obstacles that discouraged users from accessing the electronic information services in IITD. The study recommended users’ training in advanced search strategies and the use of controlled vocabulary to make the electronic search process easier, acquisition of more number of electronic primary and secondary sources, increasing the number of computer terminals and printers. The interlinking of all science and technology libraries in Delhi, including IIT, for proper sharing of their resources and incorporating new technological devices helpful to scientific research was also recommended.

Rajeswari (2005) studied the use of electronic resources and services by faculty, research scholars and students of Sri Padmavathi Mahila University, Tirupati. It was observed that Internet access, E-Mail and OPAC were used by almost all the teachers. It was also found that the teaching staff and research
scholars very much benefited from access to e-journals through ‘UGC Infonet programme’ (an e-journal consortium of University Grant Commission) The study further revealed that Internet services were used by all the category of users It was also observed that E-Mail dominates over other purpose for which they use Internet. CD-ROM database was being used very rarely by staff and students when analyzed subject-wise The study recommended better browsing facilities by providing more number of computer terminals with Internet connectivity and also provision of offline and online facility using VSAT.

Lohar and Roopashree (2006) evaluated the use of electronic resources by the faculty members in Bapuji Institute of Engineering and Technology (BIET) in Davangere, Karnataka, in their study This study covered electronic resources namely CD-ROMs, OPAC, E-books, E-journals and Internet, etc. The survey covering 60 faculty members was conducted through a questionnaire and it was found that a majority 55 (42.64%) of the respondents used Internet and 30 (23.26%) use CD-ROMs Major problems faced by the faculty in accessing the electronic resources include: too much information retrieved, lack of time and lack of training.

Singh and others (2006) investigated the availability and use of electronic journals at the Guru Nanak Dev University, Amritsar. The study revealed that a large majority of various categories of users in the university preferred electronic medium to the print journals More than 80 percent of the respondents found e-journals easier to access, time-saving and less expensive as compared to print journals It was observed that nearly half of the users were satisfied with the services being provided by the publishers of e-journals. However, most of them were not satisfied with the quality of Internet connectivity provided by the library
2.9 Inferences

From the review of literature, the following inferences could be drawn

- Studies on the use of Electronic Information Sources are conducted in respect to institutional level ranging from universities with various disciplines such as medical, agriculture, engineering and so on
- Majority of the studies are conducted in developed countries, especially USA.
- There are very few studies in India on the use of EIS. Majority of the researchers concentrated mostly on the traditional information sources, where use of EIS formed only a part of the study
- On the other hand, those Indian studies which are based only on the EIS use pattern of the academic community belonging to various disciplines are limited in scope and involve only a limited population of users.
- Majority of the studies are based upon one specific type of electronic resource like CD-ROM, online or Internet. Studies analyzing the usage of all these EIS together or in general are rare.
- It is seen from the study that there is no study on the EIS utilization pattern of the academic community in Fisheries Colleges and Fisheries Research Institutes.

Keeping in view the changing information needs of the users in the electronic environment, the investigator has chosen this study.
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