A STUDY OF THE INFORMATION SEEKING BEHAVIOUR OF SCIENCE AND TECHNOLOGY TEACHERS AND RESEARCHERS OF COCHIN UNIVERSITY OF SCIENCE AND TECHNOLOGY AND UNIVERSITY OF KERALA IN THE CHANGED LIBRARY ENVIRONMENT

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School of Library and Information Science

Certificate

This is to certify that the thesis entitled "**A study of the information seeking behavior of science and technology teachers and researchers of Cochin University of Science and Technology and University of Kerala in the changed library environment**" is a record of the bona fide research work done by Mr. Shibu Ray. S, part-time research scholar, under my supervision and guidance.

The thesis is the outcome of his original work and has not formed the basis for the award of any degree, diploma, or any other similar title.

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DECLARATION

I hereby declare that the thesis entitled "**A study of the information seeking behaviour of science and technology teachers and researchers of Cochin University of Science and Technology and University of Kerala in the changed library environment**" is a record of the bona fide research work done by me under the supervision of Dr. (Mrs.) M.D. Baby, Prof. & Head, School of Library and Information Science, Rajagiri College of Social Sciences, Kochi & University Librarian (Rtd.), CUSAT. I further declare that this thesis has not been previously formed the basis for the award of any degree, diploma, or any other similar title of recognition.

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ABSTRACT

Information communication technology (ICT) has invariably brought about fundamental changes in the way in which libraries gather, preserve and disseminate information. The study was carried out with an aim to estimate and compare the information seeking behaviour (ISB) of the academics of two prominent universities of Kerala in the context of advancements achieved through ICT.

The study was motivated by the fast changing scenario of libraries with the proliferation of many high tech products and services. The main purpose of the study was to identify the chief source of information of the academics, and also to examine academics preference upon the form and format of information source. The study also tries to estimate the adequacy of the resources and services currently provided by the libraries.

The questionnaire was the central instrument for data collection. An almost census method was adopted for data collection engaging various methods and tools for eliciting data.

The total population of the study was 957, out of which questionnaire was distributed to 859 academics. 646 academics responded to the survey, of which 564 of them were sound responses. Data was coded and analysed using Statistical Package for Social Sciences (SPSS) software and also with the help of Microsoft Excel package. Various statistical techniques were engaged to analyse data.

A paradigm shift is evident by the fact that academics push themselves towards information in internet i.e. they prefer electronic source to traditional source and the very shift is coupled itself with e-seeking of information. The study reveals that ISB of the academics is influenced primarily by personal factors and comparative analysis shows that the ISB of the academics is similar in both universities. The productivity of the academics was tested to dig up any relation with respect to their ISB, and it is found that productivity of the academics is extensively related with their ISB. Study also reveals that the users of the library are satisfied with the services provided but not with the sources and in conjunction, study also recommends ways and means to improve the existing library system.

CHAPTER 1

INTRODUCTION

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INTRODUCTION

1.0 Introduction

Evolution of human society, from primitive to modern is analogous to the progress from muscle power to money power, and finally to information or knowledge power. In this highly competitive society, each individual is striving to get information / knowledge one step ahead of others, through the established institution of education. Education includes, formal and informal, informal education starts right from family, and for those who are fortunate enough to have formal education have it from schools. Teachers, instructors and of course librarians serve as tools in materializing the successful progression of formal education. Theoretical knowledge, a counter part of the domain knowledge is acquired, stored and disseminated through a system of written communication, and libraries being the store house of knowledge are the reservoirs of this power. Judicious tapping of this power makes a man or a nation in a more advantageous position. The story of civilization indicates that libraries have been an integral part of civilized society. The libraries of today no longer function as stagnant reservoirs of books and other resources. They have become the dynamic social agencies for effective dissemination of knowledge and ideas. Ever since its existence, libraries had been performing three main functions - to gather, to conserve and to make information accessible. Library and information centres act as essential instruments for making available the real and great inherent potentials of the book and its ancestors and successors.

The technological advancements and innovations that took place over the years have transformed libraries from mere store houses of printed materials into gateways to the world of information. The role of librarians also changed in tune with the changing scenario and today's librarians are no longer passive guardians of printed materials, but have a much more active role in providing many consumerised services by understanding the user requirements and in designing the library system in coherence with the user expectations.

Libraries in general and academic libraries in particular, play an important role in fulfilling the goals of education. Academic libraries over the years supported teaching and research activities in all subjects and disciplines. Libraries are undergoing a transition period and these transformations should be in the interest of their present and potential users. The future libraries and information centres are to be more user oriented as against collection centered traditional libraries. The impact of information communication technology (ICT) on libraries and information centres has brought out radical changes in the performance of the library. A new breed of information source, the electronic resource having immense potential of information storage, retrieval etc has emerged. The ways and means of information delivery are also influenced drastically by ICT. These have brought about changes in the relation between libraries and academics also.

Information technology has brought forth a sea change in the ways in which libraries gather, conserve and disseminate information. Many digital, bibliographic and full text resources are rapidly proliferating and are playing an ever larger role in academic enrichment. Libraries were, are and will be, in the process of never ending transformation and this transformation got momentum with ICT. Modern libraries are hybrid in nature having a blend of both electronic and traditional sources. Technology has changed the entire concept of libraries from 'holding' to 'access' (Khalid, 2000).

The library environment of the universities has changed a lot with the advent of automation. The dynamic and exponential growth of information especially in the information technology environment calls for a continual research to ensure that the requirements of the information by the users are satisfactorily met and the information professionals acquire the required expertise to cope up with the operational management of the information resources and equip the library for the future.

1.01 Concept of information

It is extremely difficult to define the word information precisely. It is an amorphous concept. Shannon and Weaver describe information as any stimulus that reduces uncertainty (Shannon, et al., 1949). In the simplest sense information is the totality of stimuli acquired through all five sense organs of a human being(s). Information is

considered as something novel which adds to or changes what is already known. In the modern societal context, it is the product derived from information society and is an indispensable raw material for human advancement. The very basis of human existence is information and moreover modern society's advancement is equated with degree of accuracy in proper utilization of right information at right time. Knowledge and information are two related concepts, and the more we use information the more we gain knowledge. It is the life-blood for a researcher in any field of activity or discipline. It has a crucial role in the advancement of any society and has a definite upper hand in decision making. Perhaps, information is the backbone for any dynamic and efficient research activity and acts as oxygen for a nation's development. It is an established fact that a country which is rich in information is rich in socio-economic spheres. The information landscape divides the world into two hemispheres, between countries that make use of effective information and that which do not use it.

Information professionals are always interested in what users do and think while searching information. Information seeking refers to the process of collecting and receiving information by different means and the information scientists or the information intermediary should be aware of the information seeking behaviour (ISB) and also the characteristics of the users. Knowledge of this kind is very essential in the design of an information system. In order to achieve this, information professional should have a clear understanding of the complex process of the information seeking behaviour which has a vital link in the chain of operations starting from information need to dissemination and its variant intermediaries.

To achieve the objectives of developing a good library and information system and to arrive at the target of designing the library system and services to suit the requirements of its target users, the vital and the only most successful method perhaps is to study the information needs and interest of its users (Mahapatra, 2002).

1.02 User studies

User studies are one of the most researched areas in the library and information science literature. Library user surveys have become widespread in academic libraries during

the past twenty years and have often been used as a tool to assess service quality, library performance, library use patterns and user satisfaction.

An early user study in the field was conducted in the late 1930s by Louis R Wilson. The term user study has been defined variously by different information scientists (Devarajan, 1995). User studies are basically concerned with library user's attitude, priorities, performance and behaviour for seeking information.

User studies are analogous to the efforts of a manufacturer who surveys his market for the product he proposes to produce. In library context, it is extremely important that in-depth studies are conducted to acquire the actual and potential needs of users. On the basis of user studies the collection building, processing and organization and services are assessed to justify itself for its existence (Dhiman, 2005).

In any library or information system the user plays a vital role in planning, designing and introducing new services or products and to assess the quality of services and their utilities. User studies cover various aspects like the psychology of the users, the ISB, assessment of user needs and the utility of information resources (Hari Krishna Reddy, et al., 1997).

1.03 Information seeking behaviour

The term information seeking behaviour has been in the research literature since 1950's. ISB is one of the most important researched topics of the user studies. Researchers carried out various studies in this area, with an objective to map the academics information use and preference pattern so as to enhance their information provision. Information seeking is a complex process carried out by human being for their development and manifested through a particular behaviour. The process of information seeking is associated with various behavioural options. It results from the recognition of some need experienced by the user. When a need for information is felt, users take appropriate steps to satisfy the need by resorting to different strategies and modes of action. ISB can be viewed as the ways and means by which users gather information. ISB means the manner in which a user conducts himself in relation to a given information environment (Bavakutty, et al., 2007).

Information seeking behaviour is used to denote all activities comprising information seeking, information gathering, information receiving and communicating (Sridhar, 1995). Information seeking behaviour refers to the information needs, use patterns and various modes of locating and searching information, evaluation and use of information by the user community. When an information need is felt user takes various routes to accomplish the need, for that they may either consult published or unpublished documents or formal or informal sources or various types of information sources including electronic sources. Information seeking behaviour refers to the strategies and actions undertaken to locate discrete knowledge elements (Kumar, 2004). ISB is broadly defined as the field composed of studies that are concerned with, who needs what kind of information and for what reason; how information is found, evaluated and used; and how these needs can be identified and satisfied (Auster, 1982).

1.03.1 Factors affecting Information seeking behaviour

No two people will think and seek information alike. Many factors can influence the ISB of an individual. Socio-economic, political, cultural and psychological features influence ones ISB. The individual as a user differs with regard to a) Attitudes, beliefs, values b) Goals c) Capabilities d) Communication attitudes e) Experience and habit and f) Cultural background. All these factors can also affect the ISB process of the users (Prasad, 1992).

In searching for information, a person may be guided both by his or her level of existing level of knowledge (Individual influence) and by the accepted practices of his or her profession (Social influence) (Antony, 2006).

Line (Line, 1969) enumerates the characteristics that influence the information requirements of users. They include age, experience in research, background, qualifications, seniority, solitary or team work, persistence, thoroughness, orderliness, motivation, independence, willingness to accept help from others, breadth of approach, rate of absorption, awareness of sources, and awareness of non-literary media of communication and storage and languages understood.

Hence it is clear that ISB of an individual is influenced by innumerable factors, but any study has to make its own assumptions taking into consideration the respondents of the study.

1.1 Relevance of the study

The whole academic activity, especially teaching and research is centered on library. In present day scenario research libraries are facing many problems in the way in which they deliver information and the way in which users seek information with the impact of new technologies, which in turn demands changes in their styles, attitudes and are in need for periodic up-gradation of skills for the better management of information resource. The ever increasing expansion and scattering of information in various formats coupled with heterogeneous, micro and macro level user demands and approaches made information seeking a difficult and complex task for libraries. The problem can be sorted out with a judicious collection development policy. Collection development and its management can be planned scientifically in harmony with the outcome of a user study.

In a generic parlance a library is judged by its use and not by its collection. The satisfaction of the user, who is the key and dynamic component of any library and information system and the effective use of information system accounts for the success of any library system. Understanding the user is an important and continuous activity. The success or failure of a library and information system and its products depends upon the system's competence and ability to match up with the expectations of the users.

User expectations, approaches and seeking behaviour can be identified through user studies. The current trends in users' approach, especially in the changing scenario of libraries have prompted the researcher to investigate the ISB of academics in science and technology disciplines of Cochin University of Science and Technology and University of Kerala. The study will reveal the present information system usage and ascertain whether the library systems of both the universities are in tune with the user expectations. An understanding of such information is a prerequisite for planning and evaluating a library system.

The present study tries to investigate the ISB and to make comparison of the ISB of the academics, and also to estimate how the library system of both the universities was able to cope up with changing demands, from a user perspective. The findings of this study can be used for re-orienting the library resources and services and to attune them with the expectations of the academics.

1.2 Statement of the problem

The statement of the present study is entitled as "**A study of the information seeking behaviour of science and technology teachers and researchers of Cochin University of Science and Technology and University of Kerala in the changed library environment**".

The aim of this study is to estimate and compare the ISB of academics of both universities and also to explore, how the science and technology teachers and researchers, having different cognitive and problem solving styles, of Cochin University of Science and Technology and University of Kerala navigate differently for information in the changed library scenario.

1.3 Definition of key terms

The definitions of important terms are given below:

Information seeking: Information seeking refers to process of collecting and receiving information by different means. The means may include published or unpublished materials, textual or images, communicating with colleagues, communicating with peers, communicating with librarians etc. Kari defines information seeking as a purposeful process in which the individual attempts to find information through information sources in order to satisfy his information need (Kari, 1998).

Behaviour: Behaviour is concerned with work of action, process of selection of information resources, process of carrying out search for information, factors that affect his approach (motives, purposes, time, delegation of work etc). The behaviour

comprehends a number of components like attitude, approach, positive activity, information gathering, pattern of seeking information, psychological temperament etc (Kumar, 2004).

Information seeking behaviour: David Ellis in the International Encyclopedia of Information and Library Science defines information seeking behaviour as the complex patterns of actions and interactions that people engage in when seeking information of whatever kind for whatever purpose (Ellis, 2003). According to Girja Kumar information seeking behaviour is mainly concerned with who needs what kind of information for what reasons; how information is found, evaluated and used (Girja Kumar, 1990).

A changed library environment: A changed library environment for the purpose of study is the milieu in prevalence in any library that is in existence for at least a few decades, making use of traditional methods and practices of acquisition, organization, ...dissemination of information and its sources, which later in due course of time adopted ICT to offer computer based services and facilities. Changed libraries are such libraries which underwent transformation and themselves evolved as hybrid libraries having a blend of both electronic and traditional sources.

Teacher: Webster's encyclopedic unabridged dictionary of the English language defines teacher as a person who teaches or instructs (Webster, 1996).

Researcher: The shorter oxford English dictionary defines researcher as one who devotes himself to scientific and literary research (Little, et al., 1962).

1.4 Objectives of the study

a) To observe and examine the main source(s) of information preferred by teachers and researchers of Cochin University of Science and Technology and University of Kerala.
b) To gauge the awareness of users about the facilities in existence and to assess the extent of their utility.

c) To ascertain the level of adequacy as felt by the teachers, researchers with regard to library resources and services available in Cochin University of Science and Technology and University of Kerala.

d) To investigate the navigation strategies adopted by the academics in seeking information through different sources.

e) To observe and analyse the form of source of information preferred by the academics.

f) To compare the information seeking behaviour of teachers and research scholars (nature and type of information required, purposes of seeking information, sources of information preferred, information sharing among colleagues, informal communication network, use of library) of Cochin University of Science and Technology and University of Kerala.

g) To examine whether the various aspects described in f) have any relation with different segments of users, categorized upon age, qualification, gender, category, organizational environment and also respective disciplines of teaching/research.

h) To develop and propose a schema of actions to rectify and resolve any existing short comings, and suggest measures to improve and update the existing facilities and services.

1.5 Hypotheses

a) ISB of an individual is influenced by personal factors.

b) The pattern of the ISB of science and technology academics of the Universities is similar.

c) In this ICT era, there is a shift towards e-seeking.

d) Productivity of academics is associated with their ISB.

e) Users are satisfied with the existing sources of the library.

f) Users are satisfied with the services offered by the library.

1.6 Justification of the study

Information professionals are always keen in finding out why and how users seek information for increasing their information provision. Information gathered through user studies is a prerequisite for designing an information system and libraries need to engage actively in making the resources usable to the academic community in least possible time. Such knowledge will help to lessen the noise in the system, and also helps to fine tune the system in coherence with user expectations. Hence user studies have to be carried out on a regular basis and results of the study should form the basics of collection development and resource management.

Libraries are spending huge amount on resources and services to satisfy the users and an appraisal of the resources and services is hence very appropriate. So far no comprehensive user study has been carried out in Cochin University of Science and Technology to ascertain the user needs and expectations. In University of Kerala some studies have been carried out taking into consideration of particular disciplines, but there also such a comprehensive and comparative study has not been attempted so far.

1.7 Limitation of the study

The present study is confined to permanent faculty members and fulltime researchers of science and technology departments of Cochin University of Science and Technology and University of Kerala. The findings were arrived at based upon the questions on the questionnaire. Due to practical difficulties some aspects that come under the purview of information behaviour studies and user characteristics have not been examined in this study. The urgency of the information requirements, problems of information overload, socio-economic back ground of the academics, psychological factors and personality traits and so on are not considered for the study.

The study examines the relation or association that exists between user characteristics and ISB but does not try to establish cause and affect relationships. Despite the limitations the investigator hopes that the study will fulfill the objectives.

1.8 Organisation of the thesis

The thesis is organized in five chapters. The citation and the bibliographic reference are presented in ISO 690 – first element and date style, with slight variations.

Chapter I – Introduction

The first chapter provides a brief outline of the problem, the relevance of the study, statement of the problem, definition of key terms, objectives, hypotheses, justification, limitation of the study and organisation of the thesis.

Chapter II – Review of related literature

This chapter comprises review of literature in the topics of information seeking behaviour and its related subject.

Chapter III – Research design and methodology

Methodology chapter provides information on the population under study and the techniques and tools used in selecting the sample, in data collection and in the analysis of data.

Chapter IV – Data analysis and interpretation

This chapter deals with the detailed analysis of the collected data. The inferences drawn are also given.

Chapter V – Summary of the findings, recommendations and conclusion

This chapter deals with hypothesis testing. The findings of the study and recommendations are included in this chapter.

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CHAPTER 2

REVIEW OF RELATED LITERATURE

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.0 Introduction

Review of literature is intended to endow the researcher with pertinent information as to formulate a sound research design and make legitimate decision regarding tools for the successful completion of the study. It provides a foundation for conceptual framework, insights into methods and procedures, suggests operational definitions of major concepts and also throws light on interpretations of findings. The study of related literature implies a sequential step by step procedure of locating, reading and evaluating reports of research as well as reports of casual observations and opinion that are related to the planned research report, which are arranged in a convenient sequence either chronologically, topic-wise, geographic area-wise, or any other order which makes sense to the researcher and which has relevance to the study at hand.

Information seeking behaviour is one of the heavily researched topics in Library and Information Science and literature is scattered widely across various disciplines, hence a comprehensive review of the entire studies is difficult. Even though a handful number of studies have been carried out on the topic information seeking behaviour, only a few have attempted comparative studies.

Here an attempt has been made to review the studies that have been carried out in the topic information seeking behaviour and its allied subjects and the studies reviewed were conveniently grouped under the following categories.

1. Comparative studies in the field of information seeking behaviour
2. Information seeking behaviour
3. Review studies
4. Thesis
5. User studies

Each of these categories is again classified into international and national studies and studies are arranged chronologically in each category.

2.1 Comparative studies in the field of information seeking behaviour

2.1.1 International studies

Liao (Liao, et al., 2007) compared the information needs and ISB of international graduate students and American graduate students at Virginia Tech. The objective of this comparative study was to identify how graduate students having different characteristics use various information sources and also to obtain insights into international graduate students ISB. Web based questionnaire method was adopted for collecting data. Three hundred and sixty two graduate students (6.3%) responded to the study. Various statistical techniques namely Chi-square, ANOVA, F-test were employed for the analysis of data. Study revealed that international students use libraries more actively and often than American students. Study also showed some distinctive characteristics of the style of study of international graduate students, and also demonstrated that the impact of language or cultural communication barriers and technology barriers affects the international student's information access.

A comparative study of the information behaviour of academics of British Universities was explored by Gardiner (Gardiner, et al., 2006). The scope of the study was confined to three disciplines namely Computer and Information Science, Business / Management and English literature. The study focused on the information behaviour in the digital age with regards to the use of internet and search engines by academics from different disciplines with special reference to their use, attitude towards printed as well as electronic information resources and the major problems faced by academics in accessing electronic information. The data for the study was collected by means of a web-based questionnaire survey. Ninety seven persons responded to the study. Study showed that there were no significant difference in the use of search engines between disciplines, and about half of the respondents still make frequent use of printed materials. Study also revealed that the use of library books and electronic books varied significantly when broken down by disciplines.

Callinan (Callinan, 2005) made a comparison of the ISB of first year Biology and final year Biochemistry students of University College, Dublin, Ireland. Questionnaire method was used for collecting data. Ninety six students responded to the survey. Data obtained were analysed using Statistical Package for Social Science (SPSS). Study showed differences in the extent to which sources of information were used by students in different years of their studies. The lack of awareness is the primary reason for students not using the e-library.

Hallmark (Hallmark, 2004) investigated the methods of access and retrieval of recent journal articles cited by geoscientists and chemists who work in academia, government and industry. The study focused on the information needs and ISB of researchers in Geosciences and in Chemistry, as represented by their access and retrieval of recent journal articles cited in their publications. Citation originally published during 2002, were selected from the reference in current articles in twenty journal titles in the geoscience and fourteen in chemistry. The investigation illustrated the impact of internet on the access and retrieval of journal articles over a relatively brief period of time. Analysis of the ISB of chemists and geologists as represented by citation pattern offers a unique view of the scientific endeavor.

Roberts (Roberts, 2004) compared the information seeking skills of senior student nurses of three pre-registration nurse education programme. The study was carried out to explore the senior students' information seeking skills and to investigate whether students from different programmes utilized different seeking strategies. Purposive sampling strategy was employed for data collection and data analysis was carried out in two phases. Two hundred and fifty three nurse students participated in the survey. Study revealed both similarities and differences between the groups. The integrated degree programme participants displayed more systematic approach to information acquisition, while registered general nurse programme participants preferred the use of a model.

Song (Song, 2004) studied the ISB of domestic and international business students of University of Illinois. The study compared student's perceptions of library services and identified their library use pattern. Data collection was done by means of a web-based survey. Eighty-eight students out of two hundred and fifty nine responded to the

survey. The study was carried out to ascertain how, a) domestic and international business students make use of library instruction sessions; b) domestic and international business students' use of library services; and c) domestic and international business students' use of internet for their research. Study revealed that both domestic and international students perceived that instruction sessions were highly effective and helpful for their research needs. Profound differences were noticed with respect to primary library use and internet use between domestic and international business students.

Hiller (Hiller, 2002) carried out a study to measure the contentment of faculty and students with library services at the University of Washington. The study investigated the importance of resources, the reasons for the use or non use of libraries, information resources and their priorities for library services and resources. The study focused on the difference and also similarities between scientists/engineers and other academic areas in their library use and information needs at Washington University. The survey population included all faculties and random samples of graduate students were taken. Questionnaire method was used for the study. Survey results showed high satisfaction levels and a shift towards remote use and increased importance of electronic resources. Survey results also documented significant variations between groups and academic areas. The differences in academic areas are most pronounced in priorities, use patterns, importance of information resource formats and the impact of new technology on library use.

Siatri (Siatri, 1998) compared the ISB of academic computer scientists in British and Greek universities in an electronic environment. The study investigated how electronic information resources and information communication facilities especially those located in the internet have affected the computer scientists in terms of exchange of knowledge and information seeking behaviour. A combination of quantitative and qualitative method was used to collect data. The data analysis and comparison of findings were ongoing.

Haug (Haug, 1997) compared twelve studies that were conducted between 1978 and 1992 among US and Canadian Physicians with the aim to find out the information source preferences among the Physicians. Meta analytic method was adopted for

generalizations and to reduce the problems created by limited sampling, diverse methods and varied formats were adopted. The results showed that Physicians prefer journals as their main source of information along with books. They often consult colleagues to get answers to clinical research question.

Mendes (Mendes, et al., 1997) compared the personal information acquisition policy, use of libraries and information resources of four groups of health professionals working in three hospitals in Brazil and three hospitals in the U.K. Questionnaire and interview method was adopted for collecting data. Two hundred and seven (40%) responded to the questionnaire and thirty two interviews were carried out. Study demonstrated that information activities of health professionals in Brazil and in U.K. follow a generally similar pattern. Study also indicated that the information activities of different categories of health professionals follow similar pattern.

A comparison of the information seeking patterns of researchers in the physical and social science was carried out by Ellis (Ellis, et al., 1993). Data for the study was collected by means of interview with eighteen physicists at Manchester University and fourteen chemists at the University of Sheffield. The information seeking patterns of researchers were analysed and then compared with the findings of the previous study of ISB of Social scientists. The impact of ICT on the information seeking patterns was also considered. Study found some minor variations in the awareness level of facilities, extend of source usage etc and did not point out any major difference in the information seeking patterns of researchers.

2.1.2 National studies

A comparative study of user's outlook towards card catalogue and Online Public Access Catalogue (OPAC) was studied by Sridhar (Sridhar, 2004) at ISRO Satellite Centre (ISAC) library. The study compared the results of the study of OPAC usage with the finding of the study of the use of card catalogue of the same library conducted by the same person seventeen years ago. Data was collected by means of observation technique, and also by interaction with the users at the terminal while using OPAC. The study revealed that the catalogue consultation per day increased. But considering the fact that the collection, users and number of records on OPAC have almost doubled

over last seventeen years, the increased use of OPAC as compared to card catalogue was not remarkable. In comparison to access points in both the forms of catalogue results revealed that the title approach was adopted by a maximum of 38.3% in using OPAC as against a maximum of 54.2% adopting subject (descriptors) approach in the card catalogue search. Study also revealed that search by title has substantially increased. The study observed that the OPAC has changed the way by which catalogues were accessed and its use depends much on the practice, attitude, and behaviour of users rather than technology or tools alone.

Prasad (Prasad, et al., 1998) examined the information seeking activities of social scientists and the physical scientists and the various formal and informal sources of information consulted by them. The scope of the study was limited to scientists of Banaras Hindu University. Questionnaire method was used for data collection and twenty six scientists belonging to both Physical and Social science disciplines responded. Study revealed that there was significant difference in ISB of Physical scientists and Social scientists.

Sheena Kumari (Sheena Kumari, 1997) conducted a study on the information use pattern of Ph.D research scholars in pure science subjects of the University of Kerala. The aim of the study was to assess the research scholars' nature of information requirement during different stages of their work and the methods and strategies adopted by them in satisfying their information requirements. Questionnaire method was used for data collection which was supplemented with interviews. One hundred and twelve research scholars from nine different disciplines of pure science subjects responded to the survey. Almost all the research scholars are of the opinion that the foreign periodicals collection should be enriched. Study revealed that forty percentage of the research scholars have publications and the number of publications depends on their experience. Research scholars are aware of the indexing and abstracting periodicals in their subject and they heavily utilise these for their research activities. But research scholars of Mathematics, Statistics and Geology depend more on primary periodicals. Information seeking of research scholars differs from discipline to discipline. The information sources like supervising teachers, fellow researchers, conferences etc play a vital role in the information use pattern of researchers. The

author stressed the need for bibliographic instruction programmes for the effective use of libraries.

2.2 Information seeking behaviour

2.2.1 International studies

Tenopir (Tenopir, et al., 2009) studied the reading patterns of science, social science, technology, and medical university faculty members. The study was restricted to university science faculty members and their response was compared over time. Data for the study were collected periodically from 1977 to present through questionnaire. Study showed that the information seeking and reading patterns of science faculty changed with the growth of electronic journals. Study also found that the average number of readings per year per science faculty member continues to increase, while the average time spent per reading decreases.

The ISB of Biology students attending doctoral school at the University of Parma in Italy were studied by (Vezzosi, 2009). The study was carried out with the objective to understand their needs and also to suggest improvements in the library facilities. Data for the study was collected through semi structured interviews. Eighteen doctoral students participated in the study. Nearly all the doctoral students reported that the internet is their first and favourite point of access to any type of information and majority of them are using scirus and science direct for their information needs.

Jamali (Jamali, et al., 2008) investigated two aspects of ISB of Physicists and Astronomers at University College, London. The scope of the study was limited to the techniques adopted by the academics for keeping up-to-date and the methods used for finding articles. One hundred and fourteen people (47.1 %) responded to the survey. A self-administered web-based questionnaire was used for eliciting data from the Ph.D students and staff of the Department of Physics and Astronomy at University College, London. Study shows that even though similarities exist among academics of Physics and Astronomy with regard to ISB, there are considerable differences also. The study outlined the need for and the importance of looking deeper into subject communities within disciplines for a better understanding of the information behaviour of scientists.

Qureshi (Qureshi, et al., 2008) examined the information needs and ISB of students of nine universities in Pakistan. The study was carried out with the objective to examine the behaviour of students towards the information, to identify the main sources of information, to determine level of awareness regarding the sources and to establish whether students have had any instruction on use of resources or not. Questionnaire method was the chief instrument for collecting data, and one thousand students responded to the study. Statistical tools like correlation and regression were used to analyse data. Study found that educational and cultural background, surrounding environment and student participation have a positive impact on the ISB of students. Study also revealed that modern digital libraries, interfaces and web database sources etc also have an influence on students' information behaviour.

Bigdeli (Bigdeli, 2007) investigated the ISB of engineers at Khuzestan sugar-cane company in Iran. Questionnaire method was used to collect the data and random sampling method was employed to select sample of two hundred and fifty peoples. Data was analysed by means of various statistical techniques namely descriptive statistics, ANOVA and Tukey tests. Survey results indicated that ISB of scientists differs according to the sites they work, and they use informal channels followed by formal channels for information.

An analysis of the use behaviour of electronic journals in the field of Chemistry at University of Barcelona was carried out by Borrego (Borrego, et al., 2007). The study was carried out using the data consumption per IP address. The data for the study was collected from the publisher on the use of thirty one journals of American Chemical Society at the University in 2003. Study showed that a small group of IP address is responsible for most of the sessions, article downloads and viewing of abstracts and the dispersion was greater in the use of electronic information than in the use of information on paper.

The impact of e-resources on the ISB of health science faculty at University of Ghana was investigated by Sulemani (Sulemani, et al., 2007). The survey documented faculties' preference between print and electronic resource, and the specific database

and full text journals they found useful. The study revealed that access to internet by health science faculty had an impact on their ISB.

Chudamani (Chudamani, et al., 2006) in their conference paper underlined the importance of preparation before service. Investigators are of the view that knowledge of the ISB of scientists is essential to predict their information use and will be useful in planning and implementing an information system. Scientists are extraordinary diverse group of professionals and the attribute common to all scientists is their use of information. The study chooses this attribute and examined the ISB of scientists by reviewing selected literature. Study proposed a model for information use based on the studies on the relationship between task performance and information searching by end users.

George (George, et al., 2006) investigated the ISB of graduate students of Carnegie Mellon University. The study was carried out to determine the graduate students (masters as well as doctoral) ISB and the use of information for their scholarly activities. A sample of hundred students representing all disciplines was selected and data was collected by means of in depth structured interviews. The transcript of the interview was coded and analyzed using ATLAS.ti software. The study showed that graduate students' information gathering activity begins with teacher's direction and recommendations. Convenience, lack of sophistication in finding and using resources, course requirements affects their information behaviour. Another finding of the study was that even though internet plays a major role, students continue to use print resources. Study also revealed that there is significant variation in ISB across disciplines and between programmes. Interesting finding of the study was that the libraries influenced students' ISB.

How information retrieval was associated with users search behaviour was the topic of interest of Rose (Rose, 2006). Investigator analysed the development that took place in user interface aspects of information research. The shift in web seeking from boolean query to unrestricted queries, natural language questions, relevance ranking produced more relevant results. The article analysed the user search behaviour namely variety of information seeking goals, the cultural and situational context of search and iterative

nature of search task and suggest that interfaces can be re-designed to make searching more effective for users.

An explorative study was done by Silvio (Silvio, 2006) to ascertain the information needs and ISB of immigrant Sudanese youths in the city of London, Ontario in Canada. Data was collected from twenty four youths. Study found that Sudanese youths information needs are mainly academic in nature and their chief source of information includes colleagues, friends, neighbours and relatives. Results also showed the lack of awareness about where to obtain information on education and apprenticeship training is their main problem.

Wang (Wang, 2006) studied the academic researchers' use of internet information and communication technologies (IICT) to support information seeking activities. The goal of the study was to gain insight into disciplinary and cultural difference of information seeking in the internet era. In depth face-to-face interview method was used to collect data. Fifty five researchers from United States and ten from China were interviewed for the study. Quantitative data were coded and analysed using SPSS and quantitative data using QSR N6. To compare disciplinary differences, only faculty participants were included from the selected disciplines and countries. The preliminary results of the study showed differences in perception of importance of IICTs to research. The project was continuing to include more participants from different cultures.

Wilson (Wilson, 2006) investigated the nature of ISB in the digital information world. Author explored the behavioural pattern with special reference to electronic databases and the World Wide Web. Different models of ISB were presented and the difficulties in the process of searching were explored. Study provides insights into the seeking behaviour through electronic systems.

Asemi (Asemi, 2005) carried out a study to understand the information searching habits of internet users at the Medical University of Isfahan. The aim of the study was to investigate the status of information searching nature of the users on internet. Data was collected using a questionnaire followed by interview with users from five faculties. One hundred and eighty eight persons responded to the study. Study revealed that

students use internet significantly, and it occupies an important place among various sources. Study also observed that electronic media has not replaced print media.

Ellis (Ellis, et al., 2005) explored the ISB of English literature researchers in the Universities of the UK with respect to information revolution. Study investigated the attitude of researchers towards internet and its influence on their publication. The objective of the study was to determine the extent of the impact of electronic information sources on the ISB and attitudes of English literature researchers. The different types of electronic information sources for English literature are identified and researchers' experience in using them explored. A total of nine universities in UK were chosen for the study and data for the study was collected through mailed electronic questionnaire. Sixty researchers responded to the survey. Study established that electronic medium is making impact on the research of English literature academics.

Heinstrom (Heinstrom, 2005) investigated the information behaviour from a physiological perspective by relating information seeking to personality traits and study approaches. Author studied ISB in relation to the five factor personality theory. The study was based on three hundred and five university students who were in the process writing their masters thesis. Research design was quantitative and consisted of three questionnaires. Statistical tools used for analysis include factor, correlation and regression analysis. The main finding of study was that students information behaviour could be grouped into three patterns- fast surfing, broad scanning and deep diving, which were linked to personality traits and study approaches.

Patitungkho (Patitungkho, et al., 2005) conducted a study to identify the ISB of the faculty members in six Rajabhat Universities in Bangkok, Thailand. Questionnaire was the tool adopted for data collection. Two hundred and sixty (86%) faculty members from seven faculties namely Education, Humanities and Social science, Management, Science & Technology, Arts, Industrial technology and Agricultural technology responded to the survey. Statistical Package for Social Science (SPSS) was used for the analysis of data. Study revealed that majority of the faculty members (82%) seek information for preparing lectures and most of the faculty members (57%) prefer text books. The findings indicate that 47% of respondents record information materials in Thai and 24% record materials in English. ERIC CDROM data base was consulted by

42%. Incomplete information, lack of information and time are the problems faced by the respondents in seeking information.

Boadi (Boadi, et al., 2004) studied the distance learners in University of Lesotho with the aim to gain a deeper understanding of their characteristics and their information needs and ISB. The study focused on the distance learners' information needs, the information channels and services they use and the problems they encounter in seeking information. Data for the study were collected through questionnaire and interviews. Fifty four students responded to the questionnaire. The study showed that the distance learners exhibit the same characteristics of distance learners elsewhere by way of age, employment status, long distance from campus and therefore have less access to on-campus library and information sources and services, hence they depend on colleagues, personal collection etc for information.

Davis (Davis, 2004) in his study titled 'Information seeking behaviour of Chemists: a transaction log analysis of referral URL's' investigates the tools used and the pathways taken by the chemists in navigating electronic journals. Davis studied the ISB of scientists by analyzing the transaction log's of the American Chemical society (ACS) for members of the Cornell University community. The study found that scientists use different methods of referrals and number and types of referrals followed an inverse-square law. Scientists relied on local alternatives or personnel web page for information.

Fidel (Fidel, et al., 2004) studied the ISB of thirty two engineers having diverse educational backgrounds and expertise. The purpose of the study was to explore how engineers working in a particular organization sought information, what types of information needs they had, what sources they used, and how they selected these sources. The study was carried out to determine that factors that influenced engineers in selecting information sources. Interview method was adopted for data collection. The study revealed that the factors influenced engineers in selecting information sources were complex and involve various aspects like right format, the right level information in one place etc.

Hallmark (Hallmark, 2003). The study included Atmospheric scientists working in Universities, federal government agencies and private research institutions. The investigator collected data by approaching scientists directly and asked specific questions with the help of questionnaire. The study showed that scientists used traditional (non-electronic) methods for access and retrieval of particular citation. The results of the study provided a snapshot of the ISB of the scientists.

Murphy (Murphy, 2003) conducted a study to gain a clear understanding of how interdisciplinary scientists seek information, and how these scientists manage their time in regard to information gathering habits. Questionnaire method was adopted for the study. One hundred and forty nine (55%) scientists responded to the study. Results of the study indicated that many scientists have some difficulty in keeping up with research in their field of study with regard to time. Study also showed that interdisciplinary researchers have developed unique information gathering habit to seek out relevant information.

Abdoulaye (Abdoulaye, 2002) investigated the effect of International Islamic University Malaysia (IIUM) library on African students. Author studied the students awareness of services available to them and their preference to information. Data collection was done by means of semi-structured interview, choosing twenty students through random sampling method. Analysis of data was carried out by using SPSS. Study revealed that students were aware of the service of the library. Study also found that there was a growing importance of internet use among students and the students very rarely use printed version of abstracts and indexes. All students agreed that the library has changed their ISB.

The information gathering behaviour of Art students in six Srilankan Universities were identified by Ileperuma (Ileperuma, 2002). The study was carried out to analyse the information gathering behaviour of students in terms of purpose of seeking information, means of obtaining information and source and the type of information used. Questionnaire method was adopted to collect data. One hundred and fifty one students responded to the study, which is 69.2% of the distributed questionnaires. Statistical methods were used for the analysis of data. Study found that students gather

information for their academic purpose and also to update themselves. Study also found that publisher's catalogue was the preferred source.

Prekop (Prekop, 2002) carried out a qualitative study of a complex collaborative information seeking activity drawn from military domain. Most of the information seeking studies focused on the ISB of individuals rather than a collaborative information seeking. This study investigates the collaborative ISB performed by a working group of command and control support study. Structured interviews were used for eliciting data and were supported by minutes of the working groups meetings. A total of twenty eight participants were involved in the study. The study identified the contexts, roles and patterns of interaction that emerged from the collaborative information seeking activities undertaken by the study.

ISB of user's on the medical library website of University of Ljubljane, Slovenia was examined by Rozic-Hristouski (Rozic-Hristouski, et al., 2002). The medical library website was designed to serve as a guide to the library resources and services and it also offers hypertext links to other sites of potential interest to library users. The ISB of the Central Medical Library (CMK) website users were studied by analyzing the web server log files. These log files provides a clear picture of the users attitude towards information and web page visitor's interests can be precisely understood. Such an analysis provides valuable information to enhance the quality and delivery of information services.

Washington-Hoagland (Washington-Hoagland, et al., 2002) carried out a study to identity how graduate and professional students of University of Lowa access library resources and services. Sample for the study was selected by random stratified method and data collection was done by mailed surveys. Three hundred and eighteen students (44%) responded to the survey. Study provided an understanding of how graduate and professional students access library resources and services. Study also showed the students' perceptions and satisfaction with library services and resources.

The factors which influenced the information seeking activities of Aerospace engineers and Scientists in United States were explored by Anderson (Anderson, et al., 2001). Questionnaire method was used for data collection, and response rate was 67%.

Various statistical methods including Friedman's two-way ANOVA was used for testing the hypothesis. Study showed that information gatherers prefer those information sources that were easily accessible, and preferred interpersonal channels over print channels. The study stressed the need for providing the employees with comprehensive training programs and to develop formal and informal communication networks.

Christine Black (Christine Black, et al., 2001) in their study stressed the need for faculty librarian relationships for building a successful information literacy infrastructure which can provide a seamless blend of core subject information and information seeking and information evaluation skills. This paper not only provides the librarian-faculty collaboration model but also examples of successful campus-wide information literacy initiatives in some libraries through collaborative effort of faculty and administrators. The study revealed that the collaboration had a clear impact on user instructions and also proved to be a valuable tool in generating interest in the library by old and new faculty members.

Nicholas (Nicholas, et al., 2001) explored the relationship between the expressed health information needs and what health information seekers actually found. Data was collected from three sources namely; questionnaire hosted on website, a touch-screen health information kiosk and Kiosk transaction logs. Results of the study showed that reasons for visit to the system has an impact on the type of information viewed and identified four types of internet users. The study examined the information behaviour of health information users also.

The information needs and ISB of the biomedical scientists at institute for medical research (IMR) was studied by Zawawi (Zawawi, et al., 2001). Questionnaire method was adopted for the study and fifty four scientists responded to the study. The study found that biomedical scientists use a variety of information sources to satisfy their information needs. Scientists who were solely involved in research work considered journal articles as the most preferred information source but researchers-cum-lecturers preferred books for their information needs. Study revealed that in spite of having access to modern and up to date digital information sources, most respondents still preferred using printed materials.

Hertzum (Hertzum, et al., 2000) carried out a case study in two product-development organizations to investigate Engineers reliance on people as sources of information, factors that affect engineers' choice of information sources, seeking of information from external as well as internal sources, perceived barriers for seeking oral and written information. Study revealed that the engineers search for documents to find people, search for people to get documents, and interact socially to get information without engaging in explicit searches. Study also revealed that the major obstacle in seeking both oral and written information was cost and time involved in getting it.

Majeed (Majeed, et al., 2000) in their study explored the information needs and ISB of Malaysian Agricultural scientists. Study was carried out in five major Malaysian Agricultural institutions. Questionnaire method was used for data collection and data was collected from two hundred and thirty six respondents followed by interviews with some respondents. Study showed that majority of the scientists' preferred primary sources of information. Study also revealed that research scientists spend 16% of their office time on literature search and reading. Another important observation of the study was that 43% of the respondents were unable to keep in touch with the latest scientific literature due to deficient library collection and facilities.

United Kingdom's Veterinary practitioner's information use and ISB was studied by Wales (Wales, 2000). Questionnaire method was adopted for data collection, which was supplemented with semi-structured interviews. Eighty two people (39%) responded to the paper survey and 42% responded to email survey and seven persons were interviewed. Survey revealed that most of the respondents prefer internet to veterinary library. But conventional journals, text books and conferences were the main source of information to veterinary practitioners. Most of the users are interested in having internet based full-text journals.

Lumande (Lumande, et al., 1999) explored the ISB of academics in the eight departments that comes under the science faculty of University of Botswana. Mailed questionnaire method was adopted to elicit data and fifty four faculty members (51%) participated to the survey. SPSS was used to analyze the data. Study showed that scientific academic staff at the University of Botswana depends on journals and text

The information needs, ISB and the problems encountered by undergraduate students of Makerere University, Uganda in seeking information were studied by Kakai (Kakai, et al., 2004). The study was carried out with the purpose of suggesting strategies to enhance the use of library resources and to provide cost effective services. Non-probabilistic quota sampling and purposive sampling technique were used to identify the samples for data collection from two departments namely Biochemistry and History. Questionnaire, interview and observation method was used to collect data and one hundred and four students responded to the study. Ellis' six generic information seeking activities were considered as the bench mark for establishing undergraduate students' ISB. Chi-square test was used to test the hypotheses. The study found that students depend mainly on textbooks, rather than journals (both print and electronic) for their information needs. Study recommends user education for making students equipped in seeking information.

Meho (Meho, et al., 2003) studied ISB of Social scientists from fourteen different countries with respect to David Ellis's ISB model of Social scientists. Sample for the study was identified through searching four international bibliographic databases namely Arts & Humanities citation index, Gerbase, Social Science citation index and Sociological abstracts. After considering various aspects sixty five participants from fourteen different countries were selected for the study. Data was collected through structured and semi-structured email interviews followed by face to face interview with five faculty members. Study confirmed Ellis's model with some additional features namely accessing, networking, verifying and information managing.

Kerins (Kerins, et al., 2004) in their paper entitled "information seeking and students studying for professional careers: the case of engineering and law students in Ireland" reports the results of two empirical studies which explored the ISB of engineering and law students in Ireland. Interview method was adopted to elicit the ISB of engineering and law students. Study revealed similar patterns of ISB between students studying to become professionals. Study suggests that engineering and law students in Ireland could benefit from greater information literacy training and awareness programmes.

Communication patterns of Atmospheric scientists and the problems they encountered while accessing and retrieving journal articles and data was the study of interest of

books as their major source of information and that they were informed about the existence of information through review articles. Most of them (70%) rely on University of Botswana library resources for information. Study concluded with some recommendations for enhancing the use of library resources.

Ocholla (Ocholla, 1999) studied the ISB of the academics with respect to productivity of academics of South African Universities with particular reference to the University of Zululand. One hundred and fifty academics participated in the survey. Study found that ISB of academics was determined by the nature of the disciple as well as the rank of the academics which represents academic qualification, experience and research productivity level and they need information for career development and occupational and professional needs. Study also revealed that university libraries play a pivotal role in the information access of the academics.

Savolainen (Savolainen, 1999) investigated the place of internet among other sources and channels in information seeking. Data was collected by interviewing two thousand three hundred and eighty three persons of different ages. Study revealed that internet is rapidly showing its presence among other source and channels, and hence information sought through internet is increasing. Study also found that the major reasons for preferring information seeking through network services include easiness of accessing huge amount of data, time saving, money saving, chance to interact with more experts using discussion groups and greater independence of certain time and place in information seeking.

ISB of trainee teachers from two teacher training colleges in the State of Johor, Malaysia was investigated by Shanmugan (Shanmugan, 1999). The study investigated the information needs of trainee teachers and their perceptual feelings that arise from these needs, to establish the motives of seeking information, to explore the resources or channels chosen by trainee teachers to satisfy their needs and also to assess the extent of potential problems trainee teachers encountered in information seeking. A total of one hundred and ninety seven, fifth semester pre-service teachers were selected for the study and data collection was done by means of questionnaire. Study revealed that trainee teachers' information seeking is heavily influenced by their course requirements

and they prefer Malay language to English. Study also showed that time is a major limiting factor in the information seeking.

Fidzani (Fidzani, 1998) carried out a study to estimate the information needs, ISB and awareness of information resources by graduate students at University of Botswana. Data collection was carried out from two hundred and twenty three postgraduate students by means of open and close ended questionnaire. One hundred and forty four students responded to the survey. SPSS was used for data coding and analysis. Study revealed that most of the graduate students lacked basic skills on how to use library resources and services and hence a user orientation was needed for students using library resources and services. Study established the sources consulted by the students and their ability in using them, but failed to establish the relation between students ability to use library services and their performance in studies.

Ucak (Ucak, et al., 1998) carried out a study at Hacettepe University, Ankara, Turkey to investigate the effects of occupational factors in information needs, ISB and library usage of the scholars in Science, Engineering, Social Science and Humanities. Questionnaire method was adopted for data collection. Study showed that there are major differences in the need and ISB among the members of major disciplines. Study also showed strong similarities exist within members of each discipline. Another finding of the study was that even though scholars use both formal and informal channels to acquire information they prefer formal channel. The study recommends that the user education programme should be conducted in tune with needs of each discipline for better library use.

Curtis (Curtis, et al., 1997) investigated the ISB of health science faculty in light of the impact of information communication technologies. Authors investigated the faculties use of electronic resources and the impact of library training in ISB and analysed for any shift from the use of print to electronic formats. A survey was administered to all faculty members in medicine, nursing and pharmacy of the University of Illinois at Chicago. Mailed questionnaire method was adopted for data collection. Five hundred and fifty four (49.4%) faculty members responded to the survey. Survey showed that index medicines and MEDLINE were not sufficient to meet all the information needs of many health science faculties. Faculty members preferred accessing electronic data

bases from their offices rather than from library and most faculties did not take advantage of either in-house or electronic training sessions offered by librarians. The findings indicate the need to promote and re-engineering delivery models for training on the use of new and electronic resources.

The information seeking patterns of engineers and research scientists of Statoil's research centre in Trondheim, Norway was identified by Ellis (Ellis, 1997). Interview method was adopted to elicit data, and twenty three respondents were interviewed. The study provided a picture of the nature of their communication behaviour and the role of information seeking in relation to the performance of work tasks. Study also found that even though the behavioural characteristics of the research scientists and engineers were same there is difference in their seeking patterns.

Devadason (Devadason, et al., 1996) explored the methods for the identification of information needs of users. The study proposed that no single method or tool will enable the information needs of users but a careful selection and blending of several techniques, depending on the users were necessary. The paper proposed formal step by step procedure that can be adopted to study the information needs of majority of users. Besides gathering and recording needs, a careful analysis was made to distil actual needs from the data collected. The information needs identifier should study, prepare and equip information professionals to perform the task of identifying needs.

Information seeking behaviour of the academics at Moi University, Kenya was explored by Ocholla (Ocholla, 1996). Sample for the study was chosen randomly from four faculties namely Health science, Information science, Environmental science and Education, and data were collected through questionnaire and interviews. Twenty seven academics participated in the study. Study revealed that most of the academics depend on libraries for information. Even though they depend heavily on text book for information, they seek information from current and research oriented information sources also. Study recommends for user education for promotion of information products and services of the library.

Wilson (Wilson, 1995) in his paper entitled "Information seeking behaviour: designing information system to meet clients needs" provides some basic information on ISB. He

explains clearly the differences between needs and wants; between perceived needs and expressed needs of the users. He points out that ISB can be understood in two senses; a continuous activity in a generic sense or a highly spasmodic sense of event driven phenomena. He concludes that understanding the information seeking habit of user is possible and highly relevant to creation of effective libraries and information services.

Belkin, (Belkin, 1993) in his paper entitled "Interaction with texts: information seeking behaviour" studied information retrieval as an information seeking activity supporting people's interaction with text. Study revealed that information retrieval is a form of ISB, in which the user's interaction with text is the central phenomenon to which information retrieval is responding and supporting. The role of information retrieval was to support the users in their ISB. The possible ways to incorporate the view in the design of information retrieval system is also dealt with.

2.2.2 National studies

Naushad Ali (Naushad Ali, et al., 2006) conducted a study to investigate teachers' attitude towards central library services at Aligarh Muslim University. The study was carried out with the objective to examine teachers' opinion regarding the overall collection, facilities and services of the library and to access the frequency and purpose of using the library. Study also considered the factors for promoting library services. Questionnaire method was adopted for the study. Two hundred and ten persons (85.71%) responded to the study. Study showed that majority of the teachers are aware of the reference services, circulation, and newspaper/periodical services of the library but are unaware of the inter library loan services. Teachers of the University use the library for collecting materials for teaching purpose. Most of the teachers (55.24%) are not satisfied with the over all function of the library, and they suggested computerisation of all activities and services of the library.

Raza (Raza, et al., 2006) examined the use of electronic journals by researchers at Aligarh Muslim University. Authors carried out a study to find out the purpose, level of electronic information usage, place of use, problems faced, preference of source, and effectiveness of e-journals by researchers. Questionnaire method was used for data collection. Fifty-two research scholars responded to the survey. Data thus collected was

statistically analysed. Study revealed that researchers are aware of the e-journals available in the university. Study also revealed that the researchers use the e-journals for their research purpose and also for updating their knowledge. Majority of the researchers are of the opinion that e-journals will not replace traditional print format, and are not satisfied with the e-journals that are available in their subjects.

Information needs and use pattern of faculty members of college of Agriculture, Vellayani, Thiruvananthapuram Kerala was explored by Sarala (Sarala, et al., 2006). The scope of the study was limited to core agricultural departments of the college. Seventy eight (65%) faculty members responded to the questionnaire. Study showed that textbooks and other monographs were the most preferred information source followed by primary periodicals, and to keep updated with current developments they consult latest issues of learned journals. International network of scientists exists and they were active in the communication of scientific and technical information.

Purnima (Purnima, et al., 2005) examined the information needs, choice and access to information, problems faced by the faculties in Manipur, India. Questionnaire was the tool used for data collection. Nine hundred and seventy college faculties and sixty five university faculty members responded to the survey. Study found that faculty members seek information for academic purpose and also for writing papers, and most of the faculties are not aware of the emerging technology, digital resources, e-journals and INFLIBNET services. Study underlines the fact that librarian has a greater role in influencing education standard.

Choukhande (Choukhande, et al., 2004) examined the information needs and use patterns of faculty members and research scholars in various departments belonging to different disciplines in colleges / departments affiliated to Amravati University. Random sampling technique was used to identify the samples and for data collection various tools namely questionnaire, interviews and observation method were employed. One thousand two hundred persons responded to the survey. Statistical techniques such as simple percentage, chi-square test were employed to test the hypothesis. The survey revealed that most of the users prefer text books / handbooks as their information source and lack of knowledge in use of library services was the main difficulty in accessing information. As regards to use pattern, most of the users prefer book trade

catalogue followed by bibliographies, index and abstracts. From the study it was found that academics of the university face difficulties in accessing information through electronic sources, and they require skills in using the available resources of the library.

Sharma (Sharma, et al., 2004) studied the information seeking patterns of Defence Research and Development Establishment (DRDE) Scientists. The study estimates the information seeking patterns and the factors which influence the ISB in context of user education programme conducted by DRDE, Gwalior, Madhya Pradesh. Study revealed that success rate of getting information from library is 85%. They are using the library for referring journal articles. Lack of reading materials and lack of knowledge are the hindrance in ISB. Study also points out that internet was the commonly used medium for communication.

Information seeking behaviour of faculty members of Government Arts College in Cuddalore district, Tamilnadu was investigated by Suriya (Suriya, et al., 2004). The study was conducted to measure the reading habits and varying interests of the faculty members in their field, and also to examine the pattern of library use. Questionnaire method was used to elicit the data which was supplemented by data collected from other sources. One hundred and sixty persons responded to the study. Study showed that faculty members prefer to search by subject, and more than one fourth of the respondents do not use computer based services.

The information seeking habits of different categories of users of two postgraduate departments namely Bio-chemistry and Microbiology of Nagpur University were explored by Kafalikar (Kafalikar, et al., 2003). Census method was adopted for the study and one hundred and fifty one (83.88%) academics responded to the study. Study showed that academics visit the library for satisfying their academic needs. Study confirms a presence of invisible college in both the departments and users depend more on informal modes of communications for their information needs. Study also found that use of traditional tools like catalogue; index etc and testing sources like bibliographies were hardly noticed.

Biradar (Biradar, et al., 2001) investigated the ISB of the users of DVS Polytechnic college library. The study was carried out with the objective of evaluating the collection

of the library and also to seek user's opinion on the collection and services of the library. Data were collected through structural and detailed questionnaire and 80% students responded to the study. Study recommends for user education to its users.

Mahapatra (Mahapatra, et al., 2001) identified the modes of communication used by working journalists in seeking information from libraries. Authors investigated the principal information sources consulted and the constraints encountered by the working journalists in seeking information. Structured questionnaire method was used for data collection. Two hundred and twenty six (46%) journalists responded to the study. Study showed that majority of working journalists prefer to visit libraries personally for gathering information. Study also revealed that the major constraint faced by working journalists is paucity of time.

Vijayalakshmi (Vijayalakshmi, et al., 2001) examined the information use pattern of post-graduate lady students of various departments coming under the faculty of science and technology and social sciences of Gulbarga University, Gulbarga. The study was confined to final resident students of the university. Census method was adopted for study and seventy students (95.89%) responded to the study. Study showed that majority of the students seeks information for their course work. Study also points out that majority of the respondents use latest books, but they were not using indexing periodicals. Majority of students are not aware of the primary, secondary and tertiary source except textbooks, dictionary and encyclopedia in their concerned subjects. The study suggested creating awareness regarding the facilities and services through publicity.

Solomon (Solomon, 2000) investigated the communication patterns and ISB of Medical researchers and scientists. Author examined the prevailing situation in ten Indian Council of Medical Research (ICMR) institute libraries in India with respect to money, man power, material resources and information services. Study also investigates whether the libraries are in tune with the user expectations and also how far the users are putting the sources and services to productive use. Questionnaire method was adopted for data collection. The population was stratified as senior research officers and junior research officers. One hundred and ten participants responded to the survey. Study found that information source and services provided by the libraries vary from

library to library and only five libraries provide current awareness services. Majority of the scientists prefer formal means of communication to informal communication. Another finding regarding the use of library facilities shows that 60% of the scientist use library once in a week and 40% daily.

Information needs, use patterns, and adequacy of library resources and services of Ship Technology department of CUSAT was studied by Ammini (Ammini, 1999). The scope of the study was confined to the students of the department. Questionnaire method was adopted for the study and eighty two (93%) students responded to the survey. Study found that students of the departments were not satisfied with the library hours and they prefer text books for their information needs. Most of the users consult indexing and abstracting review periodicals and they depend on library catalogue for locating information. The students feel that library collection and services were inadequate.

Jange (Jange, et al., 1998) conducted a survey to understand the ISB of physical scientists in the five departments namely Chemistry, Electronics, Mathematics, Physics and Statistics of Gulburga University. Survey included both research scientists and family members of the University. Questionnaire method was used for data collection, and fifty seven (81.42%) academics responded to the survey. Chi-square test and Spearman's Rank correlation coefficient method were used to verify the hypothesis. Study showed that personal characteristics such as gender, possession of a Ph.D degree, nature of job responsibilities etc have no direct impact on the choice of the source of information and also personal attributes have no significant role in selecting the route in locating information from sources.

Relative importance of different source of information for the faculty members and research scholars of Karnataka University was explored by Maheswarappa (Maheswarappa, et al., 1998). Authors also examined whether personal attributes of academics have any relation on the use of information sources. Three departments namely Botany, Zoology and Bio-Chemistry of Karnataka University campus were selected for the study. Data was collected by means of questionnaire. Forty nine (90.57%) scientists responded. Study found that reprints / preprints, abstract and indexing journals, primary periodicals, research reports and subject bibliographies were

the mostly used information sources. Also the personal attributes such as designation. experience and nature of research work have bearing on the use of information sources while qualification, sex, age and nature of work have no bearing on the use of information sources among the biological scientists of the university.

Pal (Pal, 1998) conducted a study to find out the periodical use pattern by the academics at the Department of Chemistry, Guru Nank Dev University, Amritsar, India. Questionnaire method was adopted to elicit the opinion of faculty members and research scholars. Fifty two academics responded (88.1%) to the study. Study showed good use of periodicals. Research scholars consult periodicals to locate information in their own area of research. It was found that most of the academics are aware of the abstracting periodicals and most of them use this frequently.

Borse (Borse, 1997) studied the information seeking methods of farmers who got agricultural awards in the State of Maharashtra. The study was carried out to investigate how these farmers seek information; to see whether they have their own collection of information on agricultural technology and whether the accumulated information yield them valid production of agriculture. Questionnaire method was used to elicit data. Five (83.3%) farmers responded to the study. Study revealed that most of the farmers collect information through audio-visual media, and they use primary and secondary information sources on agriculture. Study also revealed that farmers adopt some specific methods for collecting information.

Chaya Devi (Chaya Devi, 1997) studied the end-users of technical information cell of National Ship Design Research Centre (NSDRC) to know their attitudes / behaviour towards the on-line information search and retrieval. Survey method was adopted for the study and questionnaire was distributed to forty employees who were using on-line resources. Twenty eight employees responded to the questionnaire. Study revealed that most of the employees (92.86%) prefer online search and the reason for that include immediate access and convenience. Most of the end users had the previous experience in the use of on-line technology. The main access points for most of the users were subject / keywords and natural language search was preferred to controlled vocabulary search. Study recommended that end-users be taught about the search strategies and the use of controlled vocabulary to make on-line search process easier.

Hari Krishna Reddy (Hari Krishna Reddy, et al., 1997) investigated the ISB of professionals in the field of disabilities in India. The study was carried out during 1993-1994 to ascertain the types of communication channels and sources used for information and the time spent in browsing / reading literature for research activities. Questionnaire method was adopted for the study supplemented by interviews. One hundred and sixty persons responded to the survey. Survey showed that the users' awareness of sources and access tools vary with age, experience, professional, educational and managerial status. Journals were the main formal source of information for preparing course / teaching materials, and books were used for providing consultation and diagnostics services.

Munjoo-Munshi (Munjoo-Munshi, et al., 1997) studied the information seeking pattern in the electronic environment. Authors theoretically analysed the seeking pattern in electronic media with respect to various attributes. Study also discussed the two consequences namely physical and intellectual and highlighted their specific attributes, which directly influenced the information seeking in electronic environment. Study points out that information seeking activities were amplified in electronic media. The increase in information seeking activities was due to the facts like more access points, more iteration of activities, more tools, and immediate feed back. Study also points out that the electronic system had its impact on physical attributes of information such as quantity, time, location and format.

Panda (Panda, et al., 1997) examined the ISB of creative writers in Oriya language. Mailed questionnaire method was used for data collection. One hundred and four writers (52%) responded to the questionnaire. Chi-square test and normal test of significance were applied for analyzing the data. Study disclosed that most of creative writers hail from teaching / research profession. Majority of the respondents are familiar with indexing services (53.4%) and they felt that user education was imperative for them for the best use of the library resources.

Sasikala (Sasikala, 1994) investigated the ISB of four hundred and thirty six managers from twenty industrial organisations in Andhra Pradesh. The study was carried out with the aim to understand the ISB of different level of managers namely senior, middle and

junior. Pre-tested questionnaire was used for collecting data. Study found that managers need data as well as descriptive type information for their information needs. They are not regular visitors of the library and they satisfy their information needs from sources other than libraries also. They seek information for updating their knowledge, to solve their practical problems and also for their job related issues. Study also revealed difference in searching and using behaviour among the different levels of managers.

The information needs of engineering scientists of regional research laboratory Bhubanesher were studied by Ramesh (Ramesh, et al., 1993). The study was carried out to explore the information needs of scientists, to list out the frequently used information sources, scientists information seeking methodologies, to design and develop a need based information system and services and to find out the usefulness of library collection. Questionnaire method was used for data collection and fifty seven scientists responded to the survey. The study revealed that all the scientists used online databases for literature search, have knowledge about information services of INSDOC, scan current periodicals for updating knowledge, preferred to have computerization of activities in libraries and majority of them expressed satisfaction over present collection of library. Among the services offered by the library current awareness service was preferred by majority (63%) of scientists.

2.3 Reviews

2.3.1 International studies

Bawden (Bawden, 2006) reviewed various concepts put forth by Wilson in the article "On user studies and information needs" published in 1981. The paper adopted a literature based conceptual analysis, with Wilson's paper as the study point and evaluated the significance of, and the later developments in the issues dealt with in that articles. Study showed that Wilson's articles had a significant effect on the development of information science. It dealt with several fundamental issues including nature of information itself, information need, and models of information seeking and information behaviour. The paper provides a perspective on the development of information seeking over thirty years.

Shenton (Shenton, et al., 2003) reviewed the information seeking models with respect to youngsters. Analysis of the past work revealed that there were four types of models covering the information behaviour of youngsters. They are instructional, grounded, narrative and synthesized models. Tabberer offers a five stage model and Kuhlatha offers a model consisting of six stages. Each writer suggests that the recognition of an information need actually starts with the information seeking process for that individual. Sample for the study were drawn from six schools of Whittey Bay, England. Individual interviews and focus groups were the principal methods of data gathering, and the data thus gathered was verified against documentary sources. The model presented by the author differs from the sequence of ISB identified by many other writers.

Brajnik (Brajnik, 1999) reviewed the various models of information seeking with the aim to ground for another model based on two levels of interaction namely presentation and navigation. The navigation and presentation levels enable the analysis of information seeking process at two levels of abstraction and group usability factors in two disjoint sets. Author argued that this would simplify both the design and evaluation process of interactive information systems.

Spink (Spink, et al., 1999) investigated the action taken by information seekers in their search for information. Authors explored the changes that took place over time, and examine changes in information seekers relevance judgments and criteria and characterize their difference. Study also examined the human information seeking and searching processes in the context of mediated on-line searching. Data was collected from one hundred and ninety eight information seekers in US and UK. The findings of the study were presented in four parts.

Hepworth (Hepworth, 1998) evaluated various studies in the field of user studies, information retrieval with respect of library human computer interface design and system analysis. Study attempted to answer questions on 1) the kind of data to be captured from users and their interaction and information requirements 2) appropriate research techniques for capturing relevant data. Study found that any user requirement analysis needs to capture the user's thoughts as well as their behaviour and the

materials required to undertake information intensive tasks, and limiting one's study to any one dimension would result in only a partial picture of the user's requirements. Also three dimensions, namely environment, behaviour and cognitive and personnel factors can be taken as the fundamental aspects for understanding user requirements.

Wilson (Wilson, 1994) in his study entitled "Information needs and uses: fifty years of progress", reviewed the developments that occurred during the past fifty years in the field of ISB and its allied areas. Author grouped the studies that were conducted over the past fifty years according to a) the method of investigation b) according to the social role of investigation c) according to discipline and d) according to the theoretical frame work. The review points out that the studies carried out in early stages were system studies rather than person centered studies, and also these studies lacked theoretical background. Another finding of the study was a need for an integrative model of information need and ISB and information use.

2.3.2 National studies

Singh (Singh, et al., 2006) investigated the ISB of agricultural scientists. Authors reviewed various studies that were carried out in the field of agricultural sciences discipline. Authors provide the importance of review of literature, meaning of key terms associated with ISB and provided sixty five review findings and their findings have been organized into six categories. The review provides a clear understanding of ISB of international agricultural scientists. The review study covered significant studies on ISB of agricultural scientists all over the world and delineated the research plan in conducting research on ISB of agricultural scientists in Indian environment.

Kawatra (Kawatra, 1985) reviewed the user studies with the aim to investigate the information seeking attitude of users, identify the gaps in knowledge of user studies, and suggest area of user attitudes for research and to out-line techniques for future research. Study investigated the attitude and need of users and reviewed eleven studies that were carried out in the field user studies.

2.4. Theses

2.4.1 International studies

Burns (Burns, 2007) explored the ISB of health professionals seeking integrative medicine related information affiliated with the four North Carolina academic programs and centers for integrative medicine. The study was carried out with the objective for better understanding of this population and to meet their information needs. A web-based survey consisting of ten close ended and open ended questions were designed based on the questions used in similar studies. The survey was administered through e-mail. Fifteen professionals (32%) responded to the survey. The study showed that the health professionals need more targeted library services due to the difficulty in finding information.

ISB of distance education students of University of North Carolina (UNC) was studied by Thompson (Thompson, 2007). The aim of the study was to identify the library use and needs of these students and to determine the library's plan of service. Survey was carried out using a web-based self administered questionnaire and the survey instrument was sent to all enrolled distance students of four departments. Nineteen students (10.5%) responded to the study. The study found that students prefer electronic resources to traditional print-based resources and was highly confident in their search abilities. Students commonly use Google and UNC libraries web pages for their research, but they consult Google more for information.

Good (Good, 2005) studied the ISB of first and second graduate students with the objective to find out the types of sources students use and the authoritativeness of the sources they use. Students who had basic computer knowledge and internet searching skills were included for the study. Participants were explained briefly about the purpose of the study and were requested to undergo the web form that included two scenarios. Fifteen students responded to the survey. Study found that although there was roughly the same number of participants for each year in school, first years look at about twice as many websites, suggesting a difference in information literacy skills or trust in the information found. Also a weak, but positive correlation between usefulness and

authority in one scenario, but not the other, reaffirms the need to flag quality health information on the web.

Al-Saleh (Al-Saleh, 2004) examined graduate students information needs from electronic information resources in three Saudi Universities namely Umm Al-Qura University, King Saud University, and King Fahad University of petroleum and minerals. Five hundred and two graduate students in three Universities were surveyed from which four hundred and eighty usable responses were obtained. Findings of the study showed that only half of the graduate students used the library electronic resources for their academic needs Chi-square test found a significant relationship between graduate students use and lack of use of library resources and students situational variables.

The effect of electronic journals on the ISB of scientists during the past ten years at the National Institute of Environmental Health Sciences (NIEHS) was examined by Gleeson (Gleeson, 2001). The study aimed to provide insights to the librarians at the NIEHS library about the preferences of their patrons and to assist them in making important decisions in collection development. Questionnaire method was used to collect data and one hundred and forty nine persons responded to the survey. Study revealed that majority of the scientists have considered e-journals as an important resource, and have integrated it into their information seeking routine.

2.4.2 National studies

The ISB and the problems encountered in seeking information by the teachers and postgraduate students of the Rajagiri College of Social Science, Kerala was studied by Antony (Antony, 2006) as a part of his M.Phil thesis. Different tools have been used to elicit data. Study showed that lack of time was the major problem in obtaining required information for students as well as for teachers. A major portion of the student community (53.2%) didn't use non-book materials, while teachers (58.3%) use non-book materials. The study showed that ISB of students and teachers vary primarily because of their different needs and requirements. The teachers and students were satisfied with the facilities and services provided by the library.

Information needs and ISB of engineering students of government engineering college Thrissur, Kerala was studied by Sheela (Sheela, 2006) as a part of her M.Phil degree. Questionnaire method was the main tool for data collection. One hundred and eighty students responded to the study. The study revealed that students visit central library for borrowing books and to prepare assignments, they prefer print media as their major source for information. Study also showed that the students are not satisfied with the systems and services provided by the central library.

The information needs and search behaviour of pure science research scholars in University of Kerala were examined by Geetha (Geetha, 2003) as a part of her doctoral thesis. Pre-structured questionnaire was used to collect data and questions were administered to respondents personally. One hundred and fifty nine scholars responded to the study. Study established that the information sources in pure science disciplines of Kerala University library are inadequate and require improvement. Study showed a variation in the use of different sources by the pure science research scholars of different disciplines.

Various investigation methods and data collection tools and techniques were adopted by Sridhar (Sridhar, 1987) to investigate the ISB of Indian space technologists. An almost census survey method was used as sampling technique and data for the study was elicited primarily through self administered questionnaire from over eight hundred space technologists. The primary motivation of space technologists is self improvement, being up-to-date in the field, maintaining professional competence, self-satisfaction and to achieve the desired result in work. Study also demonstrated that the space technologists depend slightly more on formal and documentary information sources when compared to informal and interpersonal source of information and almost all aspects of the ISB are significantly related to one or more of the six user characteristics, namely status, qualification, nature of work, specialization, experience and professional activities and achievements of the Indian space technologists.

2.5 User study

2.5.1 International studies

Siatri (Siatri, 1999) in the paper entitled "The evolution of user studies" depicts a historical background of user studies and describes the related key concepts of the topic. Author points out that all the user studies starting from 1948 have contributed in establishing and expanding the knowledge in the field. In the era of information communication technology (ICT) user studies help library professional in understanding the user needs and seeking behaviour in a better way which in turn helps the professional to serve the users better.

Meltzer (Meltzer, et al., 1995) provided a brief overview of the focus group, discussed the library use of undergraduate students at two campuses of University of California. Questionnaire and interview methods were adopted for data collection and the study at Los Angel's campus of University of California found that library need to advertise its services and students of the campus desired to have automated services. Results of Berkeley campuses revealed that most of the undergraduates were using Moffit or Doe Libraries almost exclusively, but some were unaware of the branch libraries existing in the campuses and also most of them were unaware of libraries' instructional and tour programmes.

2.5.2 National studies

The use of library facilities and information resources in first grade colleges in Shimoga district, Karnataka was identified by Lohar (Lohar, et al., 2007). Data from four hundred faculty members from thirty degree colleges in Shimoga district were elicited through questionnaire. The main intention for the use of libraries has been the academic interest of the faculty. Study concluded with findings that majority of the college libraries in Shimoga district are not having adequate and well organized library resources and services.

The expectations and perceptions of the users of National Law School of India were studied by Khaiser (Khaiser, et al., 2006). Structured questionnaire method was used

for the survey. One hundred and twenty four users (83%) responded to the study. Study found that majority of the students (87.90%) use the library on daily basis and they rated the library as very good. Users suggested that journal articles are to be indexed.

The medical practitioners' periodicals use patterns were explored by Biradar (Biradar, et al., 2001). Investigators outlined the information needs, purpose, usage, sources especially periodicals usage of medical practitioners of Shimoga City. Questionnaire method was used for data collection. Sixty medical practitioners responded to the study. Study showed that medical practitioners seek information to get information about the new procedures and latest trends in medicine. Medical practitioners irrespective of MBBS, BAMS and BDS prefer to use Indian journals and MEDLINE was the commonly used database.

Mallaiah (Mallaiah, et al., 1999) conducted a study to find out the users' perspective on library services and facilities in Mangalore University. Authors investigated the user preferences with regard to library and information requirements and other facilities. Questionnaire method was used to elicit the opinions from postgraduate students. Six hundred and thirty eight students (82.32%) responded to the study. Study found that the users were generally satisfied with the library services and sources. Study recommends that collection should be strengthened in tune with user needs and highlights the importance of user orientation.

Information use pattern of faculty members of Sri. Padmavathi Mahila Visva Vidyalayam (SPMVV), Tirupati, Andhra Pradesh was explored by Sudharani (Sudharani, et al., 1999). Investigators carried out the study to find out the information requirements of faculty members, to identify the measures for the effective use of collection and to find out the problems in seeking information. The scope of study was limited to the faculty members of Science and Arts departments. Census method was adopted for the study. Sixty one out of eighty three faculty members responded to the study. The study revealed that most of the faculty members use information sources like books, reference book, periodicals commonly, while abstracts, indexes, dissertation etc are rarely used and most of the faculty members use the library with assistance.

Faculty members use the library for current periodicals and their earlier library experience was reflected in their effective use of information.

Sahu (Sahu, et al., 1998) conducted a survey at regional research laboratory, Bhubaneswar to find out the awareness, use and preference of scientists of regional research laboratory, Bhubaneswar with special reference to CDROM data bases and computerized library services. Questionnaire method was used for data collection. The data is supplemented with other records of the library and annual reports of the institution. Ninety six scientists responded to the questionnaire. The study found that the awareness of scientist towards CDROM databases, computerization of services and networks like INTERNET makes them dependent on the type of publications and services. Study recommended for networking of libraries in the city of Bhubaneswar for better sharing of resources.

Kumbar (Kumbar, et al., 1998) in their paper titled "User education in university libraries" describes the meaning of user education and explain how user education differs from orientation and initiation. The need, objectives and methods of user education are also discussed. Authors concluded the paper with remarks that the user education programme plays a vital role in the process of information dissemination and maximum utilization of resources in university libraries.

The utilization of college libraries and their facilities by the teaching community was investigated by Bavakutty (Bavakutty, 1998). The study was carried out with the objective to examine the utilization of library resources and facilities by teachers with respect to their frequency of library visit, purpose of library visit, duration of time spent in the libraries and their borrowing patterns. One hundred and twenty three teachers responded to the survey. Study revealed that thirty four percentage of teachers use college libraries every day and they use the library to satisfy their teaching related requirements. The study also revealed that the frequency of library visits and degree of library use by teachers are some what satisfactory.

Dixit (Dixit, 1998) carried out a user study to identify the library use pattern, and to evaluate the library services and resources and its organisation at National Medical Library (NLM), New Delhi. Questionnaire method was adopted for the study and one

hundred and thirty seven members of the library responded to the survey. Study showed that the existing services of NLM were not up to standard and users were not very much conversant with the use of secondary sources. Library staffs' attitude towards users was not good.

Dalai (Dalai, et al., 1997) conducted a study to examine the users' habits, period of their study, movement, pattern of library use, use of card catalogue, books and journal usage and their opinion about library and its collection of regional research laboratory, Bhubaneswar, India. Observation and interview method was adopted for data collection. During the data collection period library was used by three hundred and eighty users for six hundred times. The study provides a picture of library use by internal or external users and the interactions with users of the library provide sufficient in sight for planning the physical layouts of libraries and the ISB of users.

Acamma (Acamma, et al., 1991) carried out a study to find out the information needs and use pattern of rubber scientists at rubber research institute of India. Data collection from sixty four rubber scientists (78%) was done by means of a questionnaire. Authors conducted the study with the objectives to judge the limitations of library system and services, exploit resources at least expense, enhance the quality of acquisition and collection and to improve the science communication system. Study found that the secondary periodicals were under utilized and the present system of services offered by the library was inadequate. Study also revealed that there is a need for user education, computer based services and to build a collection according to the needs of the users.

Devarajan (Devarajan, 1989) conducted a survey to examine the users' approaches in the field of pure sciences. Study revealed a trend towards multi disciplinary research. The pure scientists were mostly interested in reading primary journal and the collection and services provided by the Kerala University library were partially adequate to meet the research potentials.

The information use pattern of Indian Geo-Scientists was investigated by Maheswarappa (Maheswarappa, et al., 1986). Authors explored the use of information sources by Geo-Scientist as to their form, subject, country of origin, language etc and identified the journals cited and its obsolescence. The study also investigated the

Indian Geo-Scientists journal use pattern and also examined whether journal use pattern was in conformity with the law of scattering. Data for the study was collected by means of citations from the Journal of Geological Society of India covering the volumes 22-24. Citations appeared during the period 1981-83 were taken for the study. Study found that the society cites journal articles more frequently than another type of documents, and English was found to be the dominant medium. The Indian Geo-scientists' information use pattern is in tune with the Bradford's law of scattering.

Rout (Rout, 1982) in the paper entitled "measuring user satisfaction: a quantitative model" described the steps involved in evaluating the library services. Author points out that there were three levels of evaluation namely effectiveness evaluation, cost effectiveness evaluation and cost benefit evaluation and provides the criteria for evaluation.

Vashishth (Vashishth, 1982) in his article titled "user education in college libraries: a basic frame" depicts the idea of user education and its variant forms. Author provides the meaning of the term user education and describes the different stages of user education programme. The article enumerates the objectives of user education, and discusses the basic frame work for user education in the context of college libraries and suggests the elements to be included in course design for the purpose.

2.6 Conclusion

Review of literature was carried out to acquaint with the existing body of knowledge in the area of information seeking behaviour. It gave theoretical background for the study and provided guidelines in the planning of research. The investigator reviewed various international and national level studies that were carried out on the topic ISB and also comparative studies on ISB.

From the reviews it is clear that the topic is researched more in foreign countries. The comparative investigations of ISB are a less researched area. The notable characteristic of all these studies is the lack of consistency in the usage of the term information seeking behaviour. Some have adopted bibliometric analysis, citation analysis, web log

analysis and in some cases the study was confined to identifying the services and sources.

One common feature noticed in all these studies is that a good majority of the studies used questionnaire as the survey instrument or a combination of questionnaire with other instruments for eliciting data.

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CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

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3.0 Introduction

Research design is the intended blue print of the proposed study and methodology or modus operandi corresponds to the system of methods and techniques employed in identifying sources, collecting data, organizing them, and producing valid interpretations and inferences for solving the problem identified for investigation. Here, the methodology followed for the study is discussed in length and breadth.

Library system of the universities is in a transformation state with the implementation of automation and also by providing electronic resources and services to the user community. Computers were introduced in both the university libraries during 1999 and Cochin University of Science and Technology was a step ahead, and it computerized all its sections during 2000.

The methodology adopted for the study includes personal observation, survey method using questionnaire, supplemented by interview wherever clarification was required. For getting a clear idea about the topic, an exhaustive literature search was carried out, for this many primary periodicals and secondary periodicals like LISA, bibliographies etc were also consulted.

3.1 Research population

The present study intends to compare and determine the ISB of science and technology teachers and research scholars of Cochin University of Science and Technology (CUSAT) and University of Kerala. The total population of the study is 957; it includes permanent teachers and full-time research scholars of both universities.

3.2 University of Kerala ৬৪

University of Kerala is the oldest University in the state; it was established much before the birth of Kerala State. The University of Travancore, which became the University of Kerala, was established in 1937, by a promulgation of the Maharaja of Travancore, Sri Chithira Thirunal Balarama Varma who was also the first Chancellor of the University. Sir. C. P. Ramaswamy Ayyar, the then Diwan of the State, was the first Vice-Chancellor. It was the sixteenth University to be set up in India and ten colleges within the State of Travancore which were affiliated to the Madras University became the affiliated colleges of the University of Travancore. In 1957, the University of Travancore was renamed as University of Kerala with three campuses located in three different parts of the State viz. Thiruvananthapuram, Ernakulam and Kozhikode. Initially the jurisdiction of University of Kerala spans over the state of Kerala, but with the establishment of various other Universities in the state, including Cochin University of Science and Technology the area of the jurisdiction of the University of Kerala has been limited to Thiruvananthapuram, Kollam, Alappuzha Districts and some parts of Pathanamthitta District. (University of Kerala)

At present, the University has sixteen faculties and forty one departments of teaching and research. There are one hundred and eighty eight affiliated colleges. Of these, sixty three are Arts and Science colleges. There are two Law colleges, eighteen Engineering colleges (of which fifteen are unaided), five Medical Colleges (three are self-financing) forty eight aided Teachers Training Colleges, four Ayurveda Colleges, two Homeopathy Colleges, one Sidha Medical College, two Fine Arts colleges, one Music College, five Dental Colleges (of which two are unaided), five unaided Pharmacy Colleges and one college of Physical Education. Besides these, there are four affiliated institutions conducting two year full time MBA course, four colleges offering MCA and nineteen Nursing Colleges, all in the unaided sector (University of Kerala).

The University's engineering college in Kariyavattom campus offers B.Tech courses in Information Technology, Computer Science and Engineering, Electronics and Communications etc. The University Departments offer a wide range of teaching and research at post-graduate, M.Phil and Ph.D levels. At present, about thirty two colleges

offer post graduate teaching programmes. Some of the affiliated colleges offer M.Phil courses and some colleges have been recognized as research centers.

There are seventeen science and technology departments in University of Kerala. The departments that come under the category of science and technology are Aquatic Biology and Fisheries, Biochemistry, Bioinformatics, Biotechnology, Botany, Chemistry, Computer Science, Demography, Engineering, Environmental Science, Future studies, Geology, Mathematics, Optoelectronics, Physics, Statistics and Zoology. The total research population in these departments is four hundred and forty.

The University of Kerala has academic cooperation with some foreign universities like Valladolid of Spain and Claremont of the United States of America.

3.2.1 Library system of University of Kerala

The library system of the University of Kerala comprises of university library, campus library, 41 department libraries and three study centre libraries. Most of the postgraduate and research departments of the university are located at Kariyavattom, which is situated about fifteen kilometers from the main Palayam campus at Thiruvananthapuram. University library is situated at Palayam to satisfy the information requirements of the students and teachers of University of Kerala and other members, and campus library at Kariyavattom caters to the research and academic needs of the academics of the departments located there. In addition to this each postgraduate department has its own department library.

The Kerala University Library was established in 1942. It has a collection of more than 3 lakh books and over 1000 bound volumes of journals. The library subscribes to 43 foreign journals, over 400 Indian periodicals, 35 popular magazines and 20 newspapers. The total number of membership of the library is over 30,800 out of which student memberships comes to over 12,270 and that of teachers comes to 2850. Nearly 400 to 500 students, teachers and others visit the main library daily for reference and issue of books.

The library was automated using Libsys software during 2000 and has a computer system for a LAN & CD-ROM networking. A microfilm reader printer and a rare collection of journals in microfilm are also available in the library. The library has CD-ROM on many subjects and offers e-journals through consortia's, OPAC and internet facility for its members. E-journal access is provided at Kerala University Library, campus library Kariyavattom and at all the teaching departments simultaneously. More than 10,000 scholarly journals from all over the world are made available to its members. The University of Kerala offers e-journals in all areas of learning, from 23 major publishers. In addition to this, University of Kerala is getting access to Ingenta gateway portal which is a free-searchable bibliographic database of 15.2 million articles from 28,000 journal titles from 11,400 publishers. The Kerala University Library Net Information Centre (KULNIC) was established during August 2002 with the financial assistance from the Information Technology Department, Government of Kerala. Kerala University library is providing the e-journal access to its users through this centre.

The campus library is located at Kariyavattom under the administrative control of the University librarian. It has a modest collection of over 7000 books and subscribes to over 60 periodicals. Library facilities are also offered at the study centres of the University at Kollam, Alappuzha and Pandalam. The total number of books available at Kollam is about 3,750 and that of Alappuzha is 2,794 and Pandalam is over 200.

3.3 Cochin University of Science and Technology

The erstwhile University of Cochin was established on 10th July 1971 by the Cochin University Act, 1971 for the promotion of higher education with particular emphasis on postgraduate studies and research in science and technology. It was reorganized and converted into Cochin University of Science and Technology (CUSAT) in 1986 for the promotion of graduate and postgraduate studies and advanced research in Applied Science, Technology, Industry, Commerce, Management and Social Science.

The University has three campuses namely, Thrikkakara, Lakeside and Pulimcunoo and a few recognized engineering colleges. The main campus of CUSAT is located at Thrikkakara, about 15 kilometers north of Ernakulam city. Another campus of

university, the Lakeside campus is situated in Ernakulam city. Pulimcunoo campus is situated in Alapuzha, the neighboring district of Ernakulam, this campus is about 60 kilometers south of Ernakulam. Thrikkakkara campus offers various postgraduate and research studies as well as B.Tech programmes. University library and the main administrative office function here. Lakeside campus at Ernakulam offers postgraduate and research studies in Marine science and related subjects. Proximity to the sea and infrastructural facilities like a jetty, several sea-going vessels provide an environment and facilities essential for marine and related science studies. Pulimcunoo campus at Alappuzha district offers various B.Tech programmes. In addition to this there are various centres for interdisciplinary studies; Microprocessor Research, National Manpower Information, Rural Development & Appropriate Technology, Sophisticated Test and Instrumentation and Science in Society besides a Science Park functions in this campus. (Cochin University of Science and Technology)

CUSAT is academically structured into nine faculties namely Engineering, Environmental Studies, Humanities, Law, Marine Sciences, Medical Science & Technology, Science, Social Sciences and Technology. It has at present 27 departments of study and research offering postgraduate programmes across a wide spectrum of disciplines, especially in frontier areas of science and technology.

CUSAT has contacts and collaborative tie-ups with various international universities and institutions and is in the path of growth as a global centre for generation of new knowledge in frontier areas of learning. CUSAT has entered into academic collaborations and exchange programmes with many notable institutions across the USA, Europe, Russia, Japan, France, Korea etc.

In CUSAT twenty one departments come under the category of science and technology. The departments coming under the study include; Applied Chemistry, Atmospheric Science, Biotechnology, Centre of Excellence in Laser and Optoelectronic Sciences (CELOS), Chemical Oceanography, Computer Applications, Computer Science, Electronics, Engineering, Environment Science, Industrial Fisheries, Instrumentation, Marine Biology Micro Biology and Bio Chemistry, Marine Geology and Geo Physics, Mathematics, Photonics, Physical Oceanography, Physics, Polymer Science and Rubber Technology, Ship Technology and Statistics.

Total research population in these departments is five hundred and seventeen.

3.3.1 Library system of Cochin University of Science and Technology

Library system of CUSAT comprises of university library and department libraries. The university library was established in 1975 as a central agency for meeting the information requirements of the academic community of the university. It houses a balanced and rich collection on all disciplines and books of general interest. Library resources are organised according to Universal Decimal Classification and indexed according to Anglo American Cataloguing Rules with local modifications.

The library has a collection of about 70000 volumes, 280 current journals, about 800 theses and more than 300 CD-ROMs. The library has also a good collection of multimedia encyclopedias and dictionaries. The library is a depository of Indian patents and over 27,500 odd patents form an important part of the special collection. It is supplemented by a patent database on CD-INPAT, which is an index to about 50,000 records on patents granted in India from 1972 to December 1997 and brought out by INSDOC, New Delhi. The library is an active participant in the Information and Library Network (INFLIBNET) and Developing Library Network (DELNET). Through these networks, library offers databases of books, current periodicals, periodical articles, CD-ROM databases, theses etc, available among the various member libraries to its users.

Automation of the library was inaugurated on 10th March, 2000 with ADLIB software. The bibliographic records of books, journals, and theses in the library are available globally through OPAC from 2000 onwards. Library uses DSpace software for making digital repository.

Library LAN is a part of campus wide network, which has made it possible for the academic community of all the departments to have access to information from their location itself. CUSAT library has IP enabled access to online journals under the UGC-INFONET e-journals consortia and INDEST consortia set up in the campus network. In addition to this CUSAT library subscribes to e-journals and some online databases. University library has a link on the CUSAT home page and all information

pertaining to the library including OPAC, new arrivals, seminar alerts etc is available there. Online journals and databases along with a short description and its link are available in the University site, which helps users to have access to the digital collection from any where in the campus.

The library membership is open to faculty, research scholars, students and administrative staff of the University. Graduates from recognized Universities of three years standing who are residents of Greater Cochin Area are also permitted to avail of membership in the library. Industrial and research institutions are granted institutional membership.

3.4 Selection of sample and the techniques used

Sampling involves the study of a few representative units of the universe. It is a key element which determines the outcome of research; hence a careful unbiased and representative selection is required from the population under investigation. Another important factor in sample selection is the size of the sample; the sample should reasonably represent the population.

Here in this study, to have maximum representation and reliability investigator adopted an almost census method. The chance for sampling error was very much minimised by considering an almost full population.

3.5 Survey instrument

Various methods of tools have been used in the study for eliciting data from the academics' of both the universities. Questionnaire method was the central instrument for the data collection.

Based on informal interviews and observations on the research population and also with the consultation of library staff of both the universities a draft questionnaire was prepared. This was supplemented with the check points obtained while reviewing similar studies. The draft questionnaire was modified after consultation with the experts in the field of user studies. This draft questionnaire was subjected to a pilot study and

was sharpened in accordance with the user's reactions and also with the objectives set apart for the study. The data obtained through questionnaire was validated using indirect means.

The questionnaire requires about thirty minute's patience in filling up. Barring four or five questions, all the questions are close-end questions. Some questions were designed to elicit user's preference.

The survey questionnaire was designed in four parts namely; Personal information, Stages of research, Source of Information and means of communication and finally, Library use and services. Questionnaire of the study is given as appendix 1.

Part I of the survey instrument was designed to obtain the basic user characteristics; Part II was intended to elicit data on the stages of research and the types of information sought during various stages of research; Part III of the questionnaire was designed mainly for getting a vivid picture of users preference on the information sources and their means of communication; and Part IV of the questionnaire provides insights into their library use and to gauge the users awareness to the services provided by the library, this part of the questionnaire also deals with the impact of technologies on libraries.

3.6 Data collection procedure

A pilot survey was conducted from fifty students, twenty five each from both the universities to test the questionnaire, for that the investigator himself administrated the questionnaire in two departments namely Aquatic Biology and Fisheries and Mathematics of University of Kerala and Physics department of CUSAT. The pilot survey was carried out during the month of May 2006, at both the universities. The questionnaire was modified accordingly and the actual survey was undertaken during the month of June 2006 to December 2006 at University of Kerala and from August 2006 to January 2007 at CUSAT.

The investigator approached the heads of departments under study and sought permission and then collected the list of respondents of each department and subsequently contacted the academics personally with the questionnaire and handed over it to them with a brief description of the study, and in many cases sat with them and clarified their doubts and elicited their data, and in some cases prior permission through phone was obtained and interview method was adopted for eliciting the data.

Data collection was a very daunting task. Total population in both the universities was nine hundred and fifty seven, out of which investigator was able to see eight hundred and fifty nine academics only and questionnaires were distributed in person. Six hundred and forty six (75%) academics responded to the survey, out of which five hundred and sixty four (66%) of them were good responses. A total of eighty two invalid questionnaires were rejected, which included thirty six partially filled in questionnaire and forty six blank questionnaires. The questionnaires returned without answering, include those of faculties also, the reason they cited was that the questions were not answerable or they don't have enough time to look into it and in some case irrespective of approaching them personally for more than four or five times they were reluctant to return the questionnaire. There were many instances of academics refusing to accept the questionnaire also.

3.7 Techniques used for data analysis

Science and technology departments of the universities are not identical. In University of Kerala, seventeen departments that come under the broad category of science and technology are listed under three faculties namely faculty of Applied Science, faculty of Science and faculty of Engineering and Technology. In CUSAT, twenty one departments that come under the broad category of science and technology are categorised under Faculty of Engineering; Environment Science; Marine Science; Science and Technology. Since the study focused on science and technology departments, the different departments of both the universities were broadly categorised under two disciplines namely science and technology.

Data was coded and analysed using Statistical Package for Social Sciences (SPSS) statistical software and also with the help of Microsoft excel package. In addition to

simple and common statistical techniques, ANOVA, nominal regression, logistic regression, testing for proportion were used to check the relationship between variables.

References

Cochin University of Science and Technology. [Online] [Cited: December 12, 2006.] http://cusat.ac.in.

University of Kerala. [Online] [Cited: January 14, 2007.] http://www.keralauniversity.edu.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

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DATA ANALYSIS AND INTERPRETATION

4.0 Introduction

A thorough investigation of various behaviours of academics is essential to estimate their information seeking pattern. Generally academics have similar styles of requirements, but the way in which they approach for information may differ and it is difficult to portray this multifarious phenomenon. The purpose of this chapter is to describe the characteristic features of the users, estimate and compare the ISB of the academics and also to investigate how the individual characteristics relate with their information seeking habits.

4.1 Descriptive analysis of respondents' general characteristics

The study was carried out with the assumption that the ISB of the academics is influenced by their personal characteristics namely age, gender, qualification, category, discipline and also with the institution in which they were associated. The first section of the questionnaire, i.e. the Personal information; is structured for getting the relevant variables of the study under consideration.

4.1.1 Total respondents

University	Total respondents	No. of questionnaires administered	No. of questionnaires returned	No. of good responses
CUSAT	517 (54%)	473 (91.4%)	345 (72.9%)	310 (65.5%)
University of Kerala	440 (46%)	386 (87.7%)	301 (77.9%)	254 (65.8%)
Total	957 (100%)	859 (89.6%)	646 (75.5%)	564 (65.7%)

The total population of the study is 957, of which questionnaires were administered in person by the investigator to 859 academics (89.6%). A total of 646 (75.5%) questionnaires were received back. Some were partially filled in and some were blank.

A total of 82 questionnaires were rejected and finally 564 (65.7%) questionnaires which were found good are chosen for the study.

4.1.2 Age group wise distribution of respondents

Age group was chosen as a variable for the study to see that whether it have any impact on the ISB of the academicians.

Table 4.1.2 Age group of respondents of both the universities

University	Age group (years)			Total
	below 30	31 - 45	above 46	
CUSAT	183 (59.0%)	82 (26.5%)	45 (14.5%)	310 (55.0%)
University of Kerala	200 (78.7%)	38 (15.0%)	16 (6.3%)	254 (45.0%)
Total	383 (67.9%)	120 (21.3%)	61 (10.8%)	564 (100%)

Table 4.1.2 presents the age wise distribution of the sample. Out of five hundred and sixty four good responses received, majority of the respondents, 383 (67.9%) belongs to the age limit of below 30 years, 120 academics (21.3%) belongs to the category of 31-45 years and 61 respondents (10.8%) were above 46 years of age.

4.1.3 Gender wise distribution of respondents

Gender is another variable for the study just to determine whether academics' ISB has any relation with this.

Table 4.1.3 Gender wise distribution of respondents of both the universities

University	Gender		Total
	Male	Female	
CUSAT	174 (56.1%)	136 (43.9%)	310 (55.0%)
University of Kerala	96 (37.8%)	158 (62.2%)	254 (45.0%)
Total	270 (47.9%)	294 (52.1%)	564 (100%)

Table 4.1.3 shows gender wise distribution of the respondents. From table it is evident that most of the respondents are females (52.1%).

4.1.4 Qualification wise distribution of respondents

Even though the respondents of the study have almost same qualifications, the intention of the investigator is to observe whether the ISB of the academics is affected by qualifications.

Table 4.1.4 Qualification wise distribution of respondents

University	Qualification(s)					Total
	M.Tech	B.Tech	M.Sc	Ph.D	M.Phil	
CUSAT	38 (12.3%)	9 (2.9%)	165 (53.2%)	77 (24.8%)	21 (6.8%)	310 (55.0%)
University of Kerala	5 (2.0%)	14 (5.5%)	130 (51.2%)	42 (16.5%)	63 (24.8%)	254 (45.0%)
Total	43 (7.6%)	23 (4.1%)	295 (52.3%)	119 (21.1%)	84 (14.9%)	564 (100%)

Respondents possess different degrees depending upon the category and discipline by which they were associated. Majority of the respondents possess Masters degree in science (52.3%), followed by Ph.D degree (21.1%). 14.9% respondents have M.Phil degree, while 7.6% possess M.Tech and 4.1% B.Tech degree.

4.1.5 Category wise distribution of respondents

Category is also a variable of the study. The present study comprises of two categories of respondents; Teachers and Research scholars. Teacher's category comprises of three groups namely Lecturers, Readers and Professors. Research scholar's category comprises of Ph.D and M.Phil scholars.

4.1.5.1 Teachers

Table 4.1.5.1 Distribution of respondents - Teachers

University	Category - Teachers			Total
	Lecturer	Reader	Professor	
CUSAT	70 (58.3%)	29 (24.2%)	21 (17.5%)	120 (68.6%)
University of Kerala	39 (70.9%)	11 (20.0%)	5 (9.1%)	55 (31.4%)
Total	109 (62.3%)	40 (22.8%)	26 (14.9%)	175 (100%)

Table 4.1.5.1 presents the number of teachers who had responded to the study. Most of the respondents were from CUSAT (68.6%). Among them 70 were Lecturers (58.3%), followed by 29 Readers (24.2%) and 21 Professors (17.5%). From University of Kerala, 39 Lectures (70.9%), 11 Readers (20%) and 5 Professors (9.1%) responded to the study. As far as both the universities were concerned majority of the respondents were Lecturers 62.3% followed by Readers 22.8% and Professors 14.9%.

4.1.5.2 Research scholars

Table 4.1.5.2 Distribution of respondents - Research scholars

University	Category - Researchers		Total
	Ph.D	M.Phil	
CUSAT	166 (87.4%)	24 (12.6%)	190 (48.8%)
University of Kerala	122 (61.3%)	77 (38.7%)	199 (51.2%)
Total	288 (74.0%)	101 (26.0%)	389 (100%)

Almost equal number of researchers from both the universities responded to the survey. Among them majority of them were Ph.D scholars (74.0%). M.Phil research scholars accounts for 26.0%.

4.1.6 Discipline wise distribution of respondents

Discipline is also considered as a variable of the study. The study comprises of two disciplines namely science and technology.

Table 4.1.6 Discipline wise category of respondents

University	Discipline		Total
	Science	Technology	
CUSAT	190 (61.3%)	120 (38.7%)	310 (55%)
University of Kerala	190 (74.8%)	64 (25.2%)	254 (45%)
Total	380 (67.4%)	184 (32.6%)	564 (100%)

Discipline wise distribution of respondents is shown in the table 4.1.6. Table shows that majority of respondents 67.4%, belong to science discipline and technology academics account for 32.6%.

4.1.7 Publication pattern of respondents ৪১

This question was framed to analyse the productivity of the academics and to check whether there is any association between productivity of the academics and the ISB and also with the personal characteristics of the academics.

Table 4.1.7 Publication pattern of respondents

University	No of publication(s)					Total
	0	1 - 10	11 - 25	26 -100	> 100	
CUSAT	156 (50.3%)	96 (31.0%)	27 (8.7%)	28 (9.0%)	3 (1.0%)	310 (55.0%)
University of Kerala	176 (69.3%)	59 (23.2%)	9 (3.5%)	6 (2.4%)	4 (1.57%)	254 (45.0%)
Total	332 (58.9%)	155 (27.5%)	36 (6.4%)	34 (6.0%)	7 (1.2%)	564 (100%)

Table 4.1.7 shows that majority of the respondents (58.9%) do not have any publications. 155 respondents (27.5%) have up to 10 publications and 36 respondents (6.4%) have publications between 11 and 25. 34 respondents (6%) have publications ranging from 25 to 100. 7 respondents (1.2%) have more than 100 publications.

Table 4.1.7.1 Relationship of publication pattern of respondents with their characteristics

Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
University	.023	1	.023	1.370	.242
Age group	.172	2	.086	5.169	.006
Gender	.238	1	.238	14.311	.000
Qualification(s)	.769	4	.192	11.578	.000
Category	.966	4	.242	14.549	.000
Discipline	.024	1	.024	1.446	.230

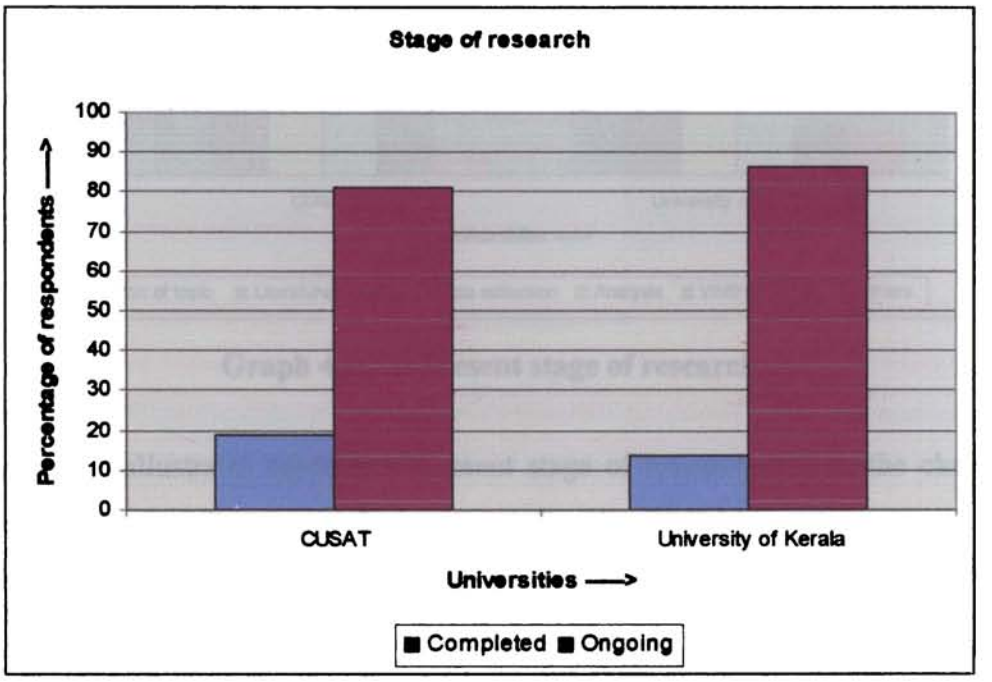
ANOVA was used to ascertain the relation of dependent variable with academician's characteristics and is presented in the Table 4.1.7.1. From table we can infer that publication pattern or the productivity of the academicians have a definite relation with age group, gender, qualification and category. The finding is in tune with the findings of Sheena Kumari (Sheena Kumari, 1997).

4.2 Stages of research

Respondents' present stage of research, time spent for research at different places, stage of research where academics depended more on was analysed and is presented here in this section.

4.2.1 Present stage of research

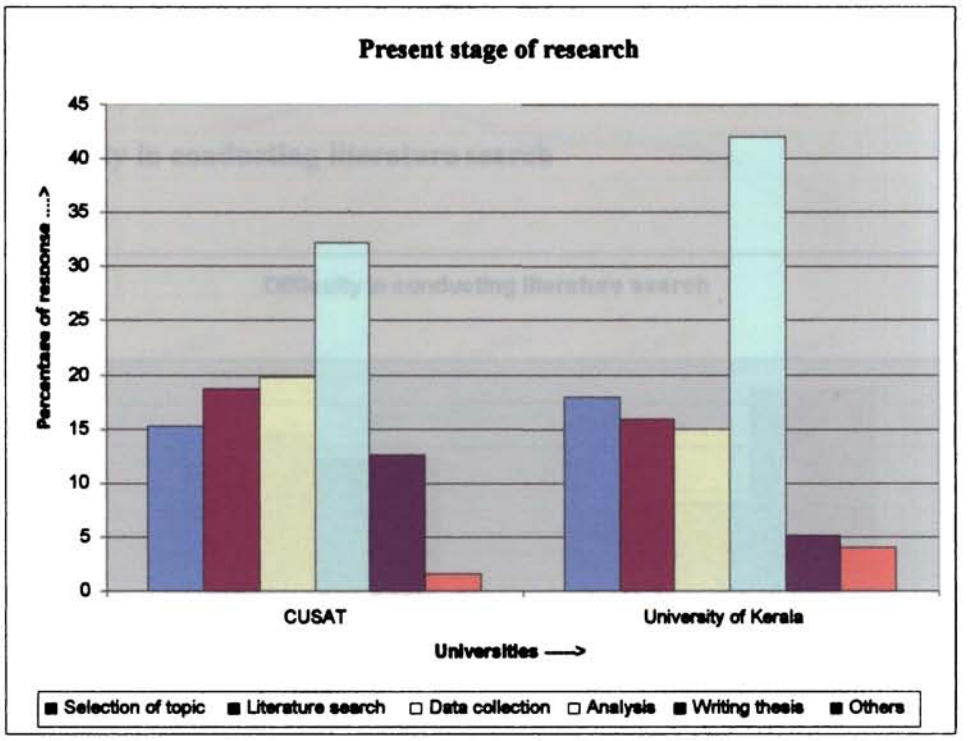
4.2.1.A Present stage of research: completed or ongoing



Graph 4.2.1.A Present stage of research: completed or ongoing

Comparative investigation of the respondent's stage of research is graphically presented here. From graph 4.2.1.A it is clear that, for more than 80% of the academics research is in progress.

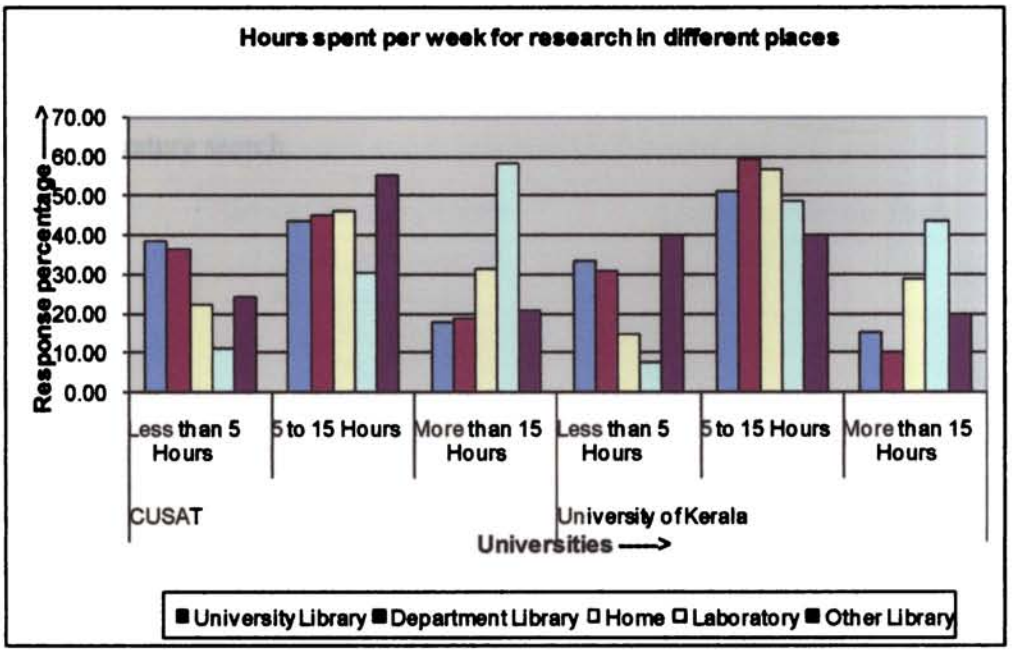
4.2.1.B Present stage of research 83



Graph 4.2.1.B Present stage of research

Graph 4.2.1.B illustrates academics' present stage of research. From the chart it is obvious that most of them are in the analysis part of the research.

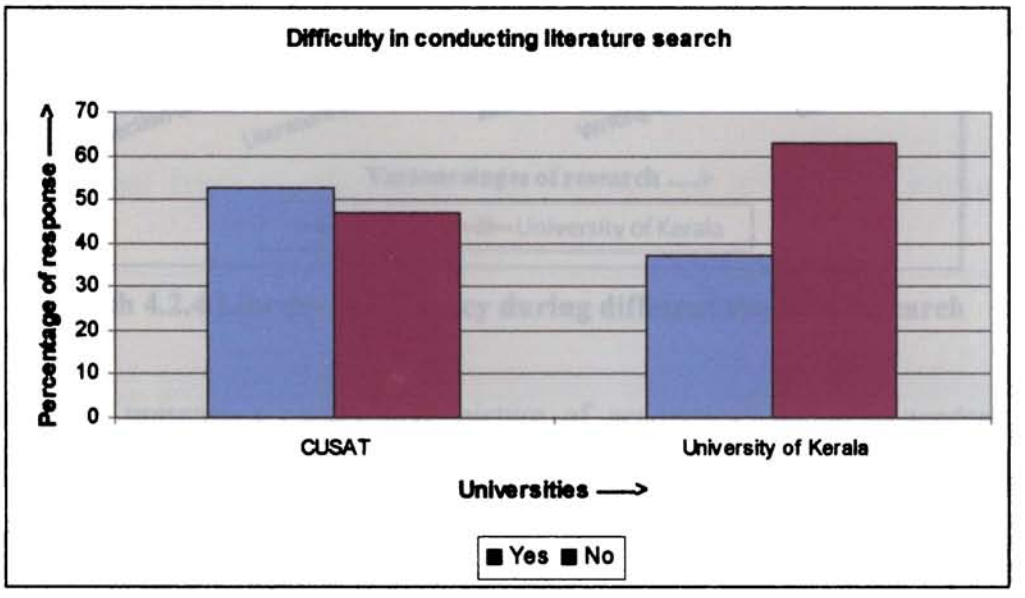
4.2.2 Hours spent for research in different places



Graph 4.2.2 Hours spent for research in different places

Graph 4.2.2 shows the time spent by academics at different places for research purpose. From graph it is clear that academics spent more time in laboratory than in libraries. The time spending trend is similar in both universities.

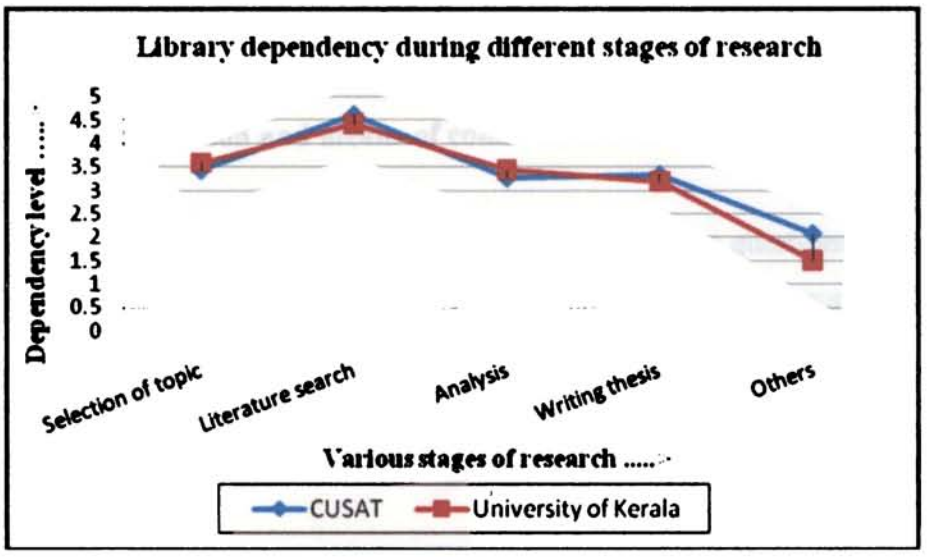
4.2.3 Difficulty in conducting literature search



Graph 4.2.3 Difficulty in conducting literature search

Graph 4.2.3 depicts comparative outlook of academics' difficulty in conducting literature search. Graph provides a mixed response, in CUSAT majority of the academics are of the opinion that they face difficulty in conducting literature search, while a good number of academics in University of Kerala doesn't feel any difficulty in carrying out literature search.

4.2.4 Library dependency during different stages of research



Graph 4.2.4 Library dependency during different stages of research

Graph 4.2.4 presents a comparative picture of academics' library dependency at different stages of research. Here the benchmark is 2.5, and the stages which have got a value of 2.5 and above means that academics depended library on that stage. From graph it is evident that in all stages of research except 'others', library was well depended and during literature search it was depended most. Graph also provides a similar behaviour pattern among academics of both universities.

Table 4.2.4 Relationship of library dependency with academics' characteristics

The relation of dependent variable with various characteristics of academics' is examined using nominal regression and is presented in the table 4.2.4.

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	275.768	7.798	4	.099
Age group	278.997	11.027	8	.200
Gender	274.905	6.935	4	.139
Qualification(s)	294.588	26.617	16	.046
Category	286.299	18.329	16	.305
Discipline	273.147	5.176	4	.270

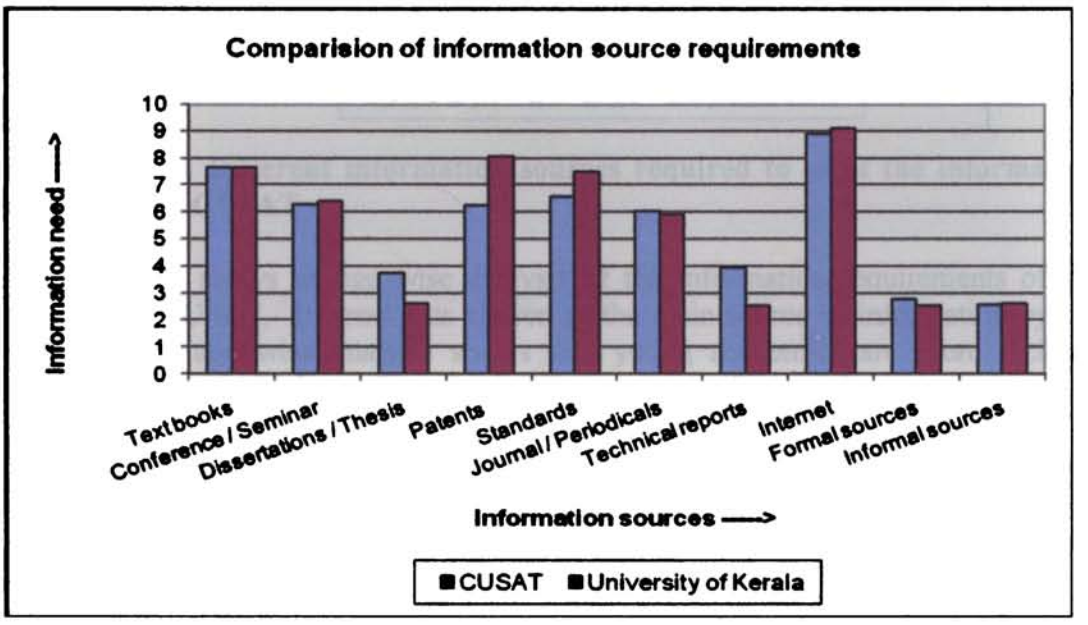
a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

From table 4.2.4 it is clear that qualification has an impact on academics library dependency during different stages of their research work.

4.3 Source of information and means of communication

Since ISB cannot be estimated with a single question, various questions were framed taking into consideration the various facets of ISB and is broadly categorized under the heading source of information and means of communication.

4.3.1 Different types of information sources required to meet the information needs

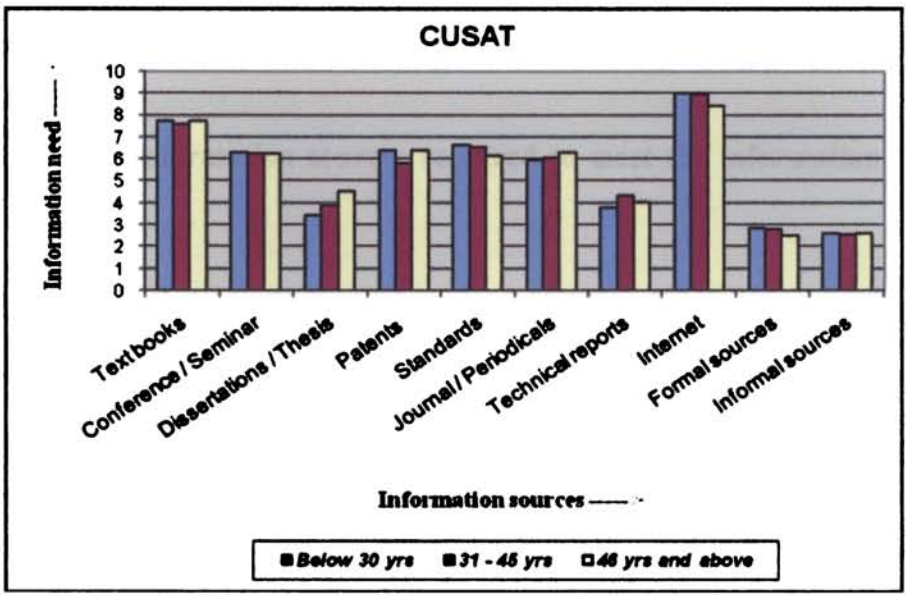


Graph 4.3.1 Different information sources required to meet the information needs

Above graph shows a comparative picture of the type of information source required to meet the information needs of the academics of both the universities. From the graph it is clear that academics prefer internet as their main source of information. Asemi (Asemi, 2005), Sharma (Sharma, et al., 2004), Savolainen (Savolainen, 1999) endow with a parallel view. Abdoulaye (Abdoulaye, 2002) found a growing importance of internet use. The academics of University of Kerala choose patents while academics of CUSAT choose text books as their second choice of information source.

4.3.1.1 Different information sources required to meet the information needs Vs Age

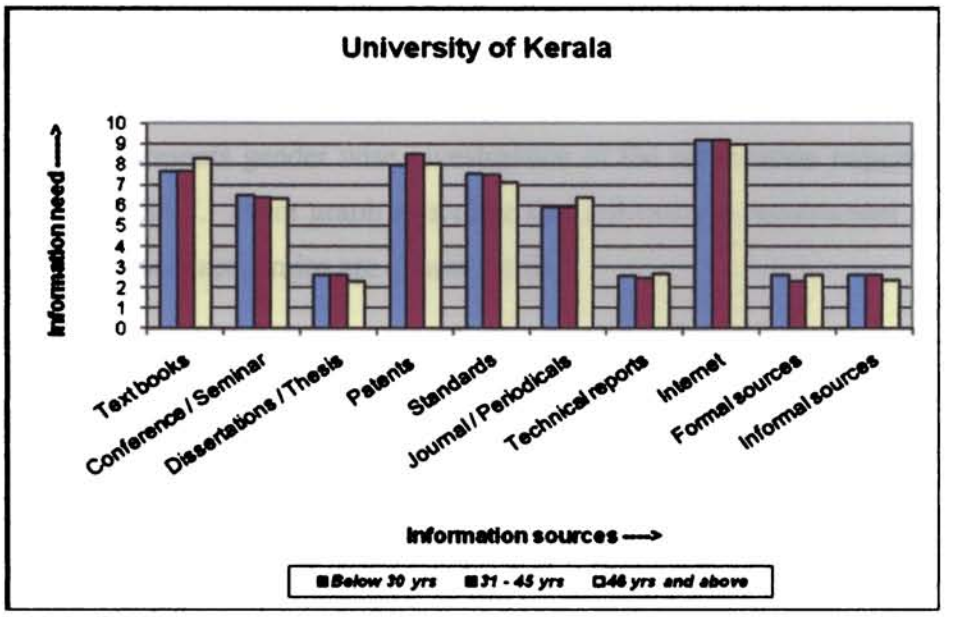
4.3.1.1.1 CUSAT



Graph 4.3.1.1.1 Different information sources required to meet the information needs Vs Age – CUSAT

Graph 4.3.1.1.1 shows an age wise analysis of the information requirements of the academics in CUSAT. Internet was chosen as the main source of information by the academics. An age wise analysis shows that young academics are more inclined towards this source of information.

4.3.1.1.2 University of Kerala

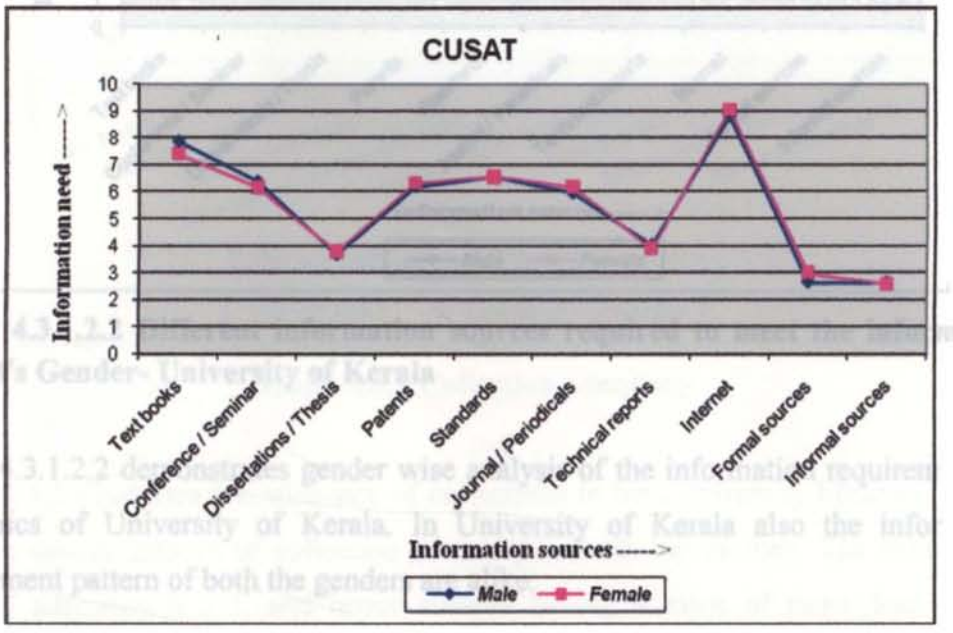


Graph 4.3.1.1.2 Different information sources required to meet the information needs Vs Age – University of Kerala

Age wise analysis in University of Kerala shows that academics within the age limit 31-45 are slightly more inclined towards internet than academics within the age limit of below 30 years of age, and here also the young academics are more inclined towards this source of information.

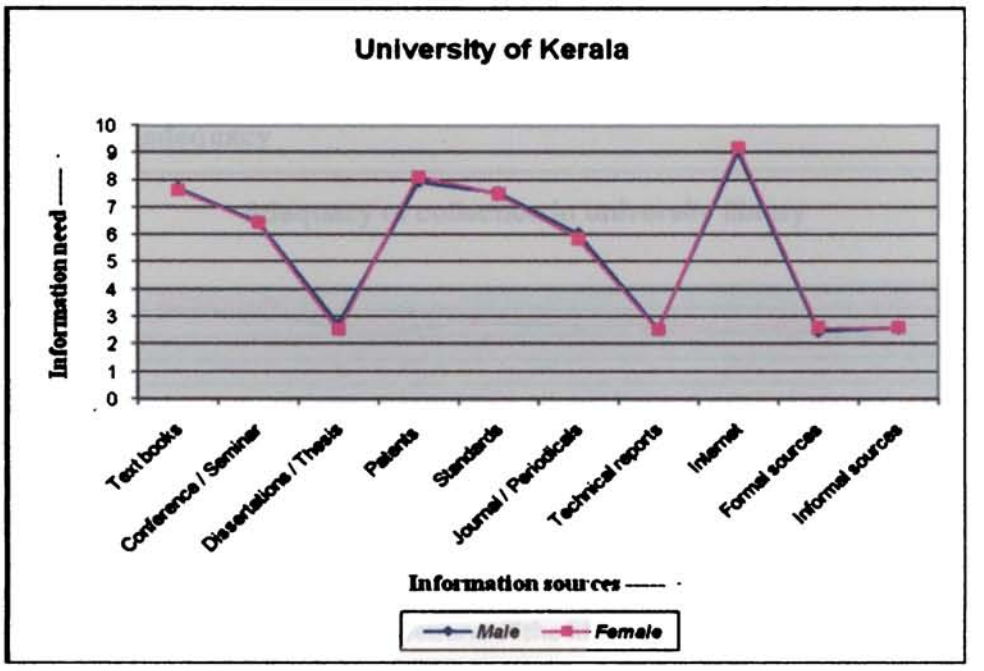
4.3.1.2 Different information sources required to meet the information needs Vs Gender

4.3.1.2.1 CUSAT



Graph 4.3.1.2.1 Different information sources required to meet the information needs Vs Gender - CUSAT

Graph 4.3.1.2.1 presents gender wise investigation of the information requirements of academics of CUSAT. From graph it is clear that information requirement pattern of both male and female academics are almost similar.



Graph 4.3.1.2.2 Different information sources required to meet the information needs Vs Gender- University of Kerala

Graph 4.3.1.2.2 demonstrates gender wise analysis of the information requirements of academics of University of Kerala. In University of Kerala also the information requirement pattern of both the genders are alike.

Table 4.3.1 Relationship of information sources to satisfy user needs with academics characteristics

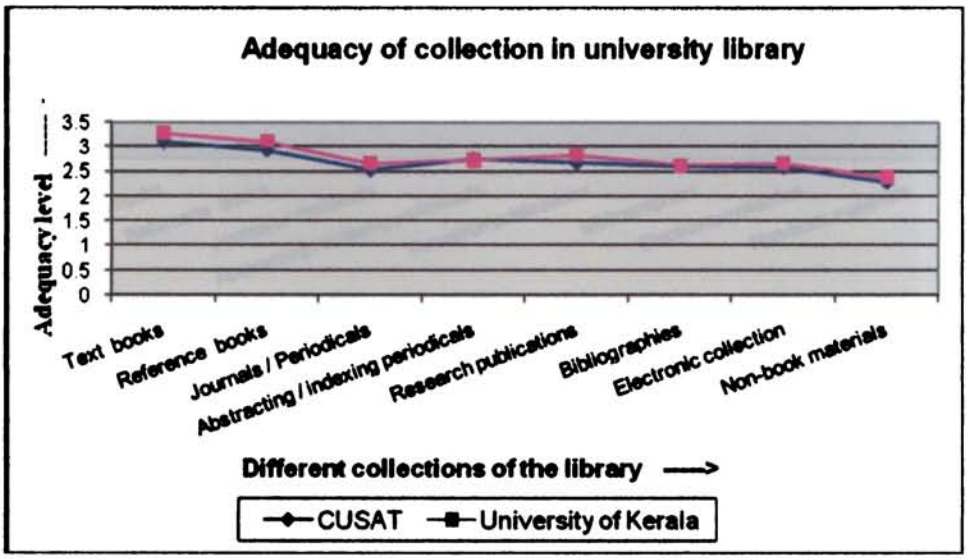
Significance between dependent variable and respondents characteristics was tested using nominal regression and is presented here.

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	684.656	19.850	8	.011
Age group	684.184	19.378	16	.250
Gender	672.797	7.991	8	.434
Qualification(s)	701.473	36.667	32	.261
Category	696.631	31.824	32	.475
Discipline	697.711	32.905	8	.000

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

From table 4.3.1 it is clear that discipline and institution have an effect on academics information source requirements.

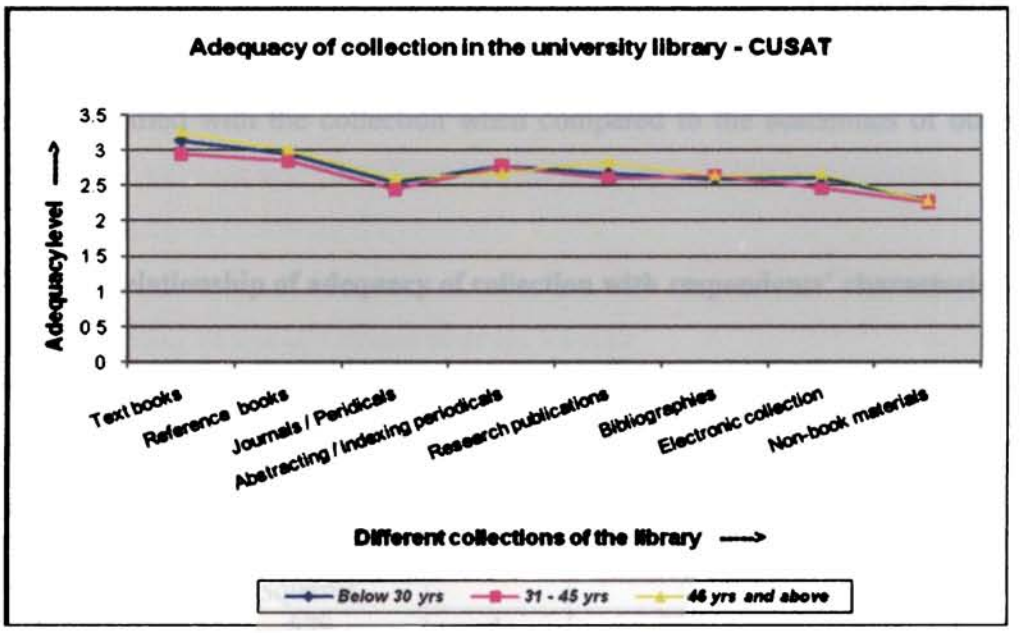
4.3.2 Collection adequacy



Graph 4.3.2 Collection adequacy

Graph 4.3.2 illustrates the adequacy of collections in both university libraries. Graph shows a similar pattern of collection adequacy in both universities. The bench-mark level of adequacy is 2.5, and hence sources having a value of more than 2.5 are adequate source. From graph it is evident that text books and reference books are the most adequate sources. Journals / periodicals and electronic collection of the universities are also adequate, but not as adequate as other sources and non-book materials are inadequate.

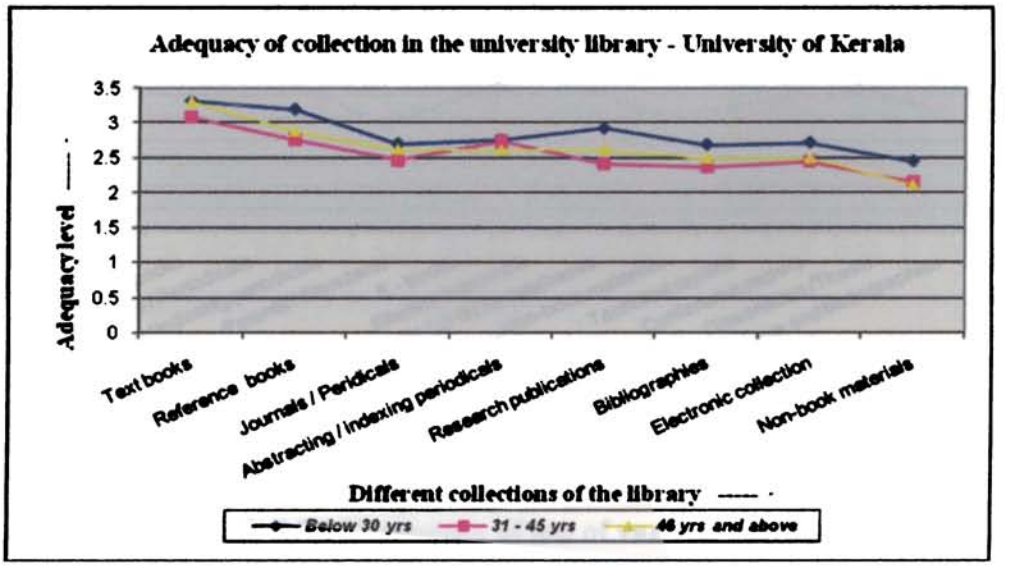
4.3.2.1 Collection adequacy Vs Age- CUSAT ९१



Graph 4.3.2.1 Collection adequacy Vs Age- CUSAT

Graph 4.3.2.1 demonstrates the age wise response to the adequacy of collection in university library of CUSAT. Age wise analysis shows that academics with age limit 46 and above are more satisfied with the collections of the library except in few cases like abstracting and indexing periodicals, bibliographies and non-book materials. And as far as textbooks and reference collection are concerned, this group of academics is the most satisfied group.

4.3.2.2 Collection adequacy Vs Age- University of Kerala



Graph 4.3.2.2 Collection adequacy Vs Age- University of Kerala

Graph 4.3.2.2 shows the age wise response to the adequacy of collection in the library of University of Kerala. In University of Kerala, academics below thirty years of age are more satisfied with the collection when compared to the academics of other age groups.

Table 4.3.2 Relationship of adequacy of collection with respondents' characteristics

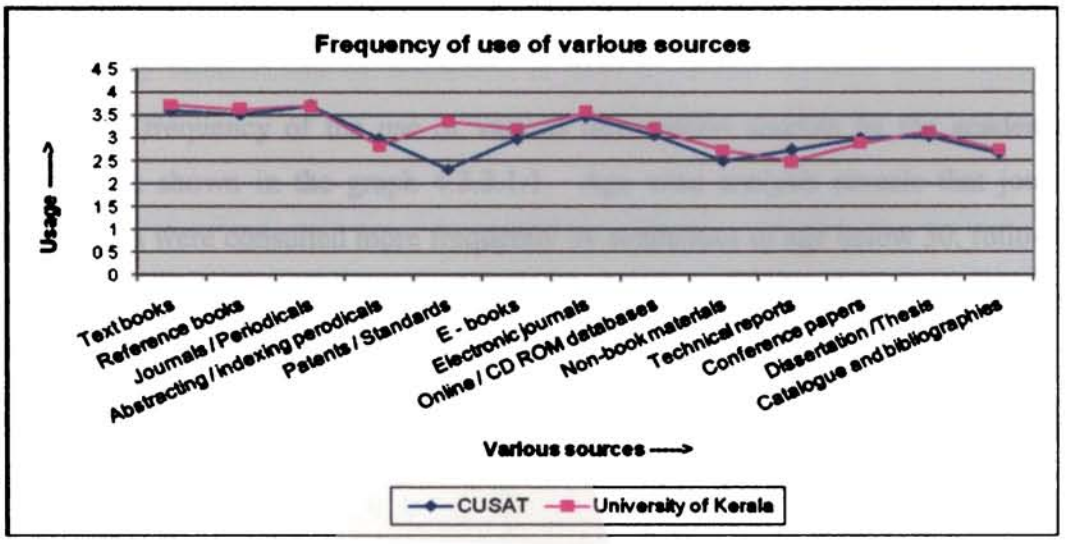
Relation between the adequacy of collection and respondents characteristics is tested using ANOVA and is presented below.

Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
University	.579	1	.579	2.107	.147
Age group	2.522	2	1.261	4.591	.011
Gender	.097	1	.097	.354	.552
Qualification(s)	.888	4	.222	.808	.520
Category	3.348	4	.837	3.047	.017
Discipline	.178	1	.178	.648	.421

a R Squared = .058 (Adjusted R Squared = .035)

Table shows that age group and category have an effect on the dependent variable.

4.3.3 Frequency of use of various sources

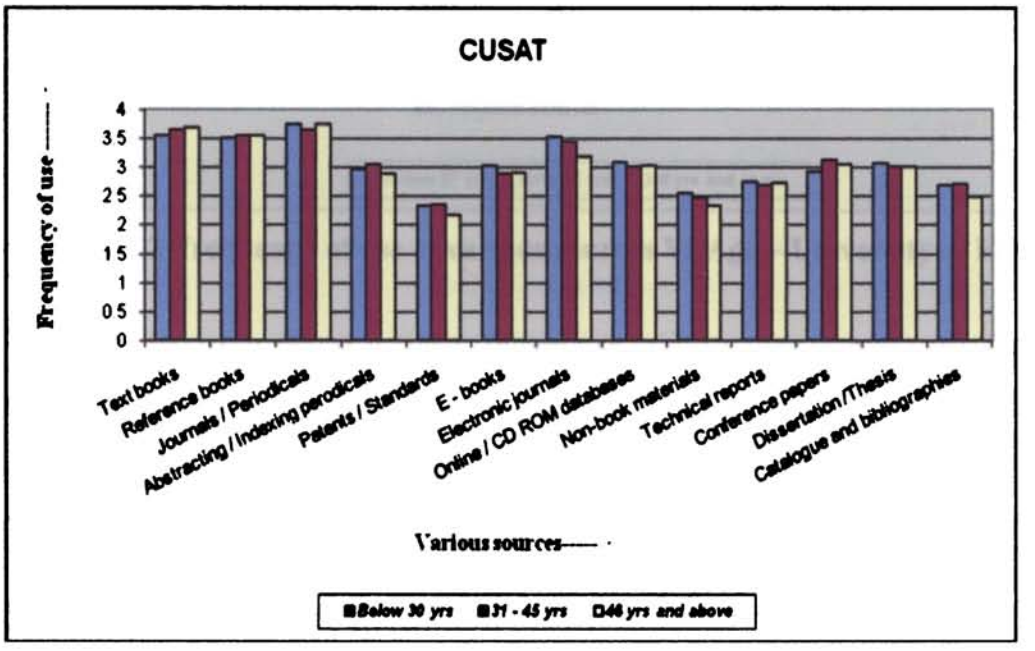


Graph 4.3.3 Frequency of use of various sources

Graph 4.3.3 presents a comparative picture of the academics information resource usage in both the university. The use pattern of the academics of both the universities is quite similar. The point of reference of usage is 2.5, and from the figure it is evident that most of the sources are used frequently and the most used source in both the universities is journals and periodicals followed by text books and reference source. Electronic collection is also used frequently.

4.3.3.1 Frequency of use of various sources Vs Age

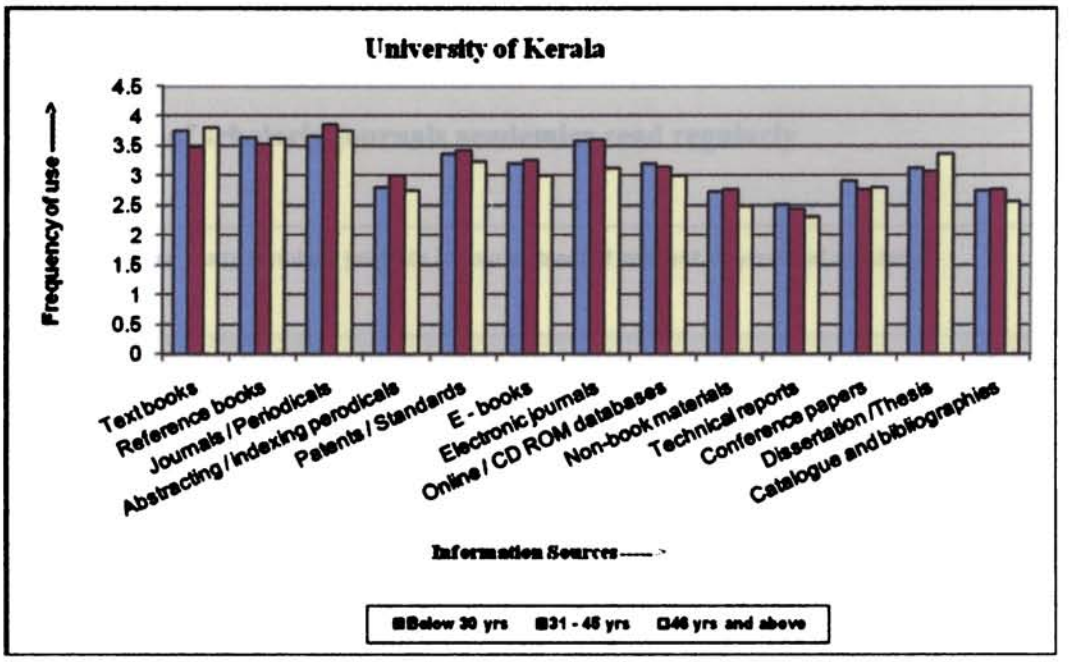
4.3.3.1.1 Frequency of use of various sources Vs Age - CUSAT



Graph 4.3.3.1.1 Frequency of use of various sources Vs Age - CUSAT

Age wise frequency of the use of various information sources by the academics of CUSAT is shown in the graph 4.3.3.1.1. Age wise analysis reveals that journals / periodicals were consulted more frequently by academics of age below 30, followed by academics having age limit 46 and above. Electronic collection also is frequently consulted by academics below 30 years of age.

4.3.3.1.2 Frequency of use of various sources Vs Age – University of Kerala



Graph 4.3.3.1.2 Frequency of use of various sources Vs Age – University of Kerala

Above graph presents the frequency of use of various information sources by academics of University of Kerala. As far as journals / periodicals are concerned, academics within the age limit 31-45 use this source more frequently, followed by academics with age limit 46 and above and academics below 30 years of age. In University of Kerala also the electronic collection is used by more frequently by the younger academics.

Table 4.3.3 Relationship of frequency of use of various sources with respondents' characteristics

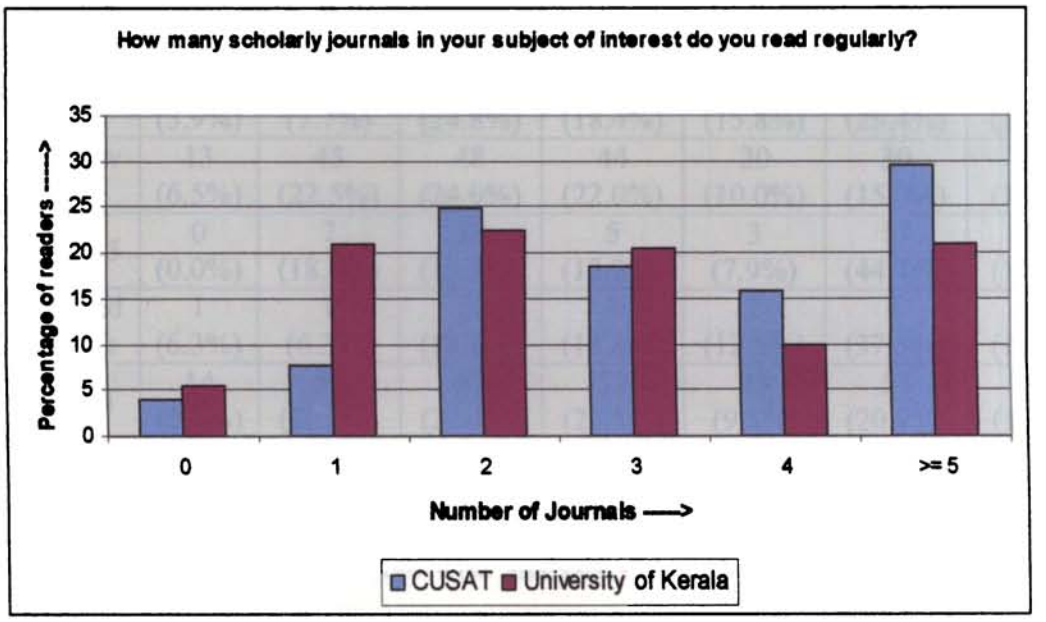
ANOVA was used to find out any relation exists if any, between the frequency of use of various information sources and respondents characteristics and is presented here.

Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
University	.622	1	.622	2.765	.097
Age group	1.666	2	.833	3.701	.025
Gender	.172	1	.172	.764	.383
Qualification(s)	.978	4	.245	1.086	.362
Category	2.067	4	.517	2.296	.058
Discipline	.183	1	.183	.814	.367

a R Squared = .036 (Adjusted R Squared = .013)

From table 4.3.3 it is evident that, there exists a relation between the dependent variable and academics characteristics like age group and category.

4.3.4 Number of scholarly journals academics read regularly



Graph 4.3.4 Number of scholarly journals academics read regularly

From the above graph it is clear that, academics of CUSAT are using scholarly journals more when compared to academics of University of Kerala. It is interesting to note that 3.9% academics in CUSAT and 5.5% academics in University of Kerala are not using scholarly journals regularly.

Table 4.3.4.1 Number of scholarly journals academics read regularly Vs Age

		Age (Years)	No of scholarly journals you read regularly						Total
			0	1	2	3	4	>5	
University	CUSAT	Below 30	7 (3.8%)	13 (7.1%)	45 (24.6%)	38 (20.8%)	27 (14.8%)	53 (29.0%)	183 (100%)
		31- 45	3 (3.7%)	6 (7.3%)	23 (28.0%)	11 (13.4%)	16 (19.5%)	23 (28.0%)	82 (100%)
		46 and above	2 (4.4%)	5 (11.1%)	9 (20.0%)	8 (17.8%)	6 (13.3%)	15 (33.3%)	45 (100%)
		Total	12 (3.9%)	24 (7.7%)	77 (24.8%)	57 (18.4%)	49 (15.8%)	91 (29.4%)	310 (100%)
	University of Kerala	Below 30	13 (6.5%)	45 (22.5%)	48 (24.0%)	44 (22.0%)	20 (10.0%)	30 (15.0%)	200 (100%)
		31- 45	0 (0.0%)	7 (18.4%)	6 (15.8%)	5 (13.2%)	3 (7.9%)	17 (44.7%)	38 (100%)
		46 and above	1 (6.3%)	1 (6.3%)	3 (18.8%)	3 (18.8%)	2 (12.5%)	6 (37.5%)	16 (100%)
		Total	14 (5.5%)	53 (20.9%)	57 (22.4%)	52 (20.5%)	25 (9.8%)	53 (20.9%)	254 (100%)

Age wise analysis of the number of scholarly journal usage was examined and is presented in the table 4.3.4.1. Age wise analysis shows that in CUSAT, academics with in the age limit 46 and above, and in University of Kerala academics with in the age limit 31- 45, are consulting scholarly journals more.

Table 4.3.4.2 Number of scholarly journals academics read regularly Vs Gender

		Gender	No of scholarly journals you read regularly						Total
			0	1	2	3	4	>5	
University	CUSAT	Male	8 (4.6%)	11 (6.3%)	41 (23.6%)	25 (14.4%)	28 (16.1%)	61 (35.1%)	174 (100%)
		Female	4 (2.9%)	13 (9.6%)	36 (26.5%)	32 (23.5%)	21 (15.4%)	30 (22.1%)	136 (100%)
		Total	12 (3.9%)	24 (7.7%)	77 (24.8%)	57 (18.4%)	49 (15.8%)	91 (29.4%)	310 (100%)
	University of Kerala	Male	5 (5.2%)	16 (16.7%)	28 (29.2%)	11 (11.5%)	7 (7.3%)	29 (30.2%)	96 (100%)
		Female	9 (5.7%)	37 (23.4%)	29 (18.4%)	41 (25.9%)	18 (11.4%)	24 (15.2%)	158 (100%)
		Total	14 (5.5%)	53 (20.9%)	57 (22.4%)	52 (20.5%)	25 (9.8%)	53 (20.9%)	254 (100%)

Table 4.3.4.2 reveals that male academics are regularly using more journals in both the universities. In that, university wise analysis reveals that male academics of CUSAT are using more number of scholarly journals.

Table 4.3.4.3 Number of scholarly journals academics read regularly Vs Discipline

		Discipline	No of scholarly journals you read regularly						Total
			0	1	2	3	4	>5	
University	CUSAT	Science	10 (5.3%)	17 (8.9%)	42 (22.1%)	28 (14.8%)	32 (16.8%)	61 (32.1%)	190 (100%)
		Technology	2 (1.7%)	7 (5.8%)	35 (29.2%)	29 (24.1%)	17 (14.2%)	30 (25.0%)	120 (100.0%)
		Total	12 (3.9%)	24 (7.7%)	77 (24.8%)	57 (18.4%)	49 (15.8%)	91 (29.4%)	310 (100%)
	University of Kerala	Science	10 (5.3%)	44 (23.2%)	38 (20.0%)	36 (18.9%)	20 (10.5%)	42 (22.1%)	190 (100%)
		Technology	4 (6.3%)	9 (14.0%)	19 (29.7%)	16 (25.0%)	5 (7.8%)	11 (17.2%)	64 (100%)
		Total	14 (5.5%)	53 (20.9%)	57 (22.4%)	52 (20.5%)	25 (9.8%)	53 (20.9%)	254 (100%)

Discipline wise number of journal usage among academics of the universities was examined and is tabulated in 4.3.4.3. Discipline wise analysis shows that science academics are consulting scholarly journals more when compared to technology academics.

4.3.4.4 Number of scholarly journals academics read regularly Vs Category

Table 4.3.4.4.1 Number of scholarly journals academics read regularly Vs Teachers

		Category - Teachers	No of scholarly journals you read regularly						Total
			0	1	2	3	4	>5	
University	CUSAT	Lecturer	2 (2.9%)	6 (8.6%)	17 (24.3%)	16 (22.9%)	11 (15.7%)	18 (25.7%)	70 (100%)
		Reader	1 (3.4%)	1 (3.4%)	10 (34.5%)	5 (17.2%)	5 (17.2%)	7 (24.1%)	29 (100%)
		Professor	1 (4.8%)	1 (4.8%)	4 (19.0%)	3 (14.3%)	2 (9.5%)	10 (47.6%)	21 (100%)
		Total	4 (3.3%)	8 (6.7%)	31 (25.8%)	24 (20.0%)	18 (15.0%)	35 (29.2%)	120 (100%)
	University of Kerala	Lecturer	0 (0.0%)	9 (23.1%)	10 (25.6%)	7 (17.9%)	1 (2.6%)	12 (30.8%)	39 (100%)
		Reader	1 (9.1%)	1 (9.1%)	2 (18.2%)	1 (9.1%)	2 (18.2%)	4 (36.4%)	11 (100%)
		Professor	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (40.0%)	0 (0.0%)	3 (60.0%)	5 (100%)
		Total	1 (1.8%)	10 (18.2%)	12 (21.8%)	10 (18.2%)	3 (5.5%)	19 (34.5%)	55 (100%)

Teacher wise analysis shows that in both the universities, Professors are consulting more number of scholarly journals regularly. 4 (3.3%) teachers in CUSAT and 1 (1.8%) in University of Kerala are not using journals regularly.

Table 4.3.4.4.2 Number of scholarly journals academics read regularly Vs Research scholars

		Category - Researchers	No of scholarly journals you read regularly						Total
			0	1	2	3	4	>5	
University	CUSAT	Ph.D	5 (3.0%)	12 (7.2%)	40 (24.1%)	29 (17.5%)	28 (16.9%)	52 (31.3%)	166 (100%)
		M.Phil	3 (12.5 %)	4 (16.7%)	6 (25.0%)	4 (16.7%)	3 (12.5%)	4 (16.7%)	24 (100%)
		Total	8 (4.2%)	16 (8.4%)	46 (24.2%)	33 (17.4%)	31 (16.3%)	56 (29.5%)	190 (100%)
	University of Kerala	Ph.D	7 (5.7%)	21 (17.2%)	24 (19.7%)	27 (22.1%)	14 (11.5%)	29 (23.8%)	122 (100%)
		M.Phil	6 (7.8%)	22 (28.6%)	21 (27.3%)	15 (19.5%)	8 (10.4%)	5 (6.5%)	77 (100%)
		Total	13 (6.5%)	43 (21.6%)	45 (22.6%)	42 (21.1%)	22 (11.1%)	34 (17.1%)	199 (100%)

Research scholar wise number of journal consultation was examined and is presented in the table 4.3.4.4.2. Category wise analysis of research scholars shows that Ph.D scholars are using scholarly journals more in comparison with M.Phil scholars in both the universities.

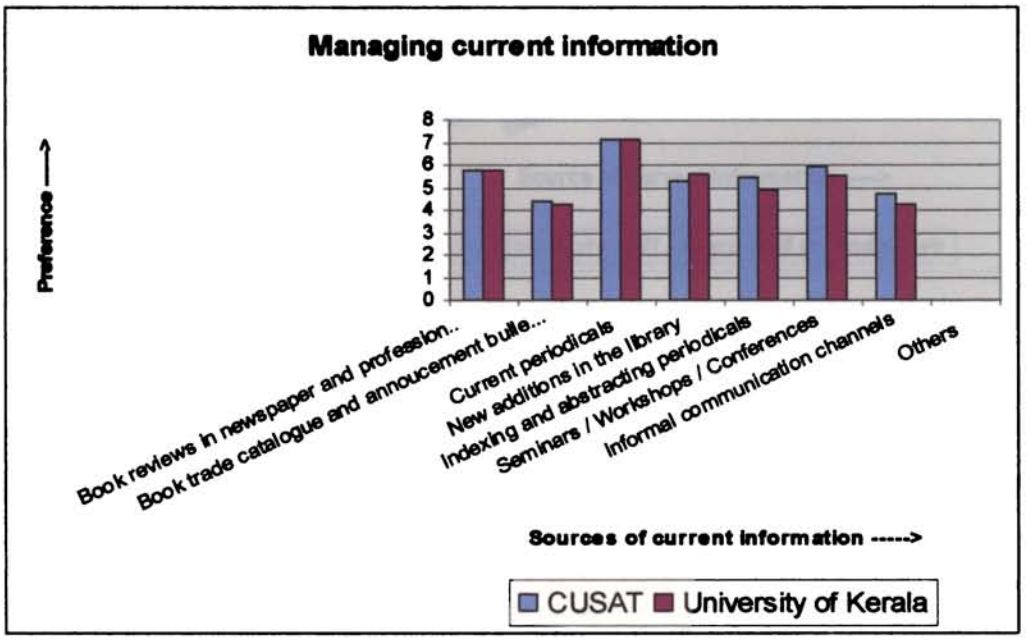
Table 4.3.4 Relationship of the number of journals read with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	832.298	13.706	5	.018
Age group	826.722	8.129	10	.616
Gender	840.223	21.630	5	.001
Qualification(s)	832.192	13.599	20	.850
Category	843.820	25.227	20	.193
Discipline	835.901	17.308	5	.004

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom

Nominal regression method was used to check whether there exists any relation between the dependent variable and the user characteristics. From table 4.3.4 it is evident that gender, discipline and university have a definite relation with the dependent variable.

4.3.5 Method of collecting current information

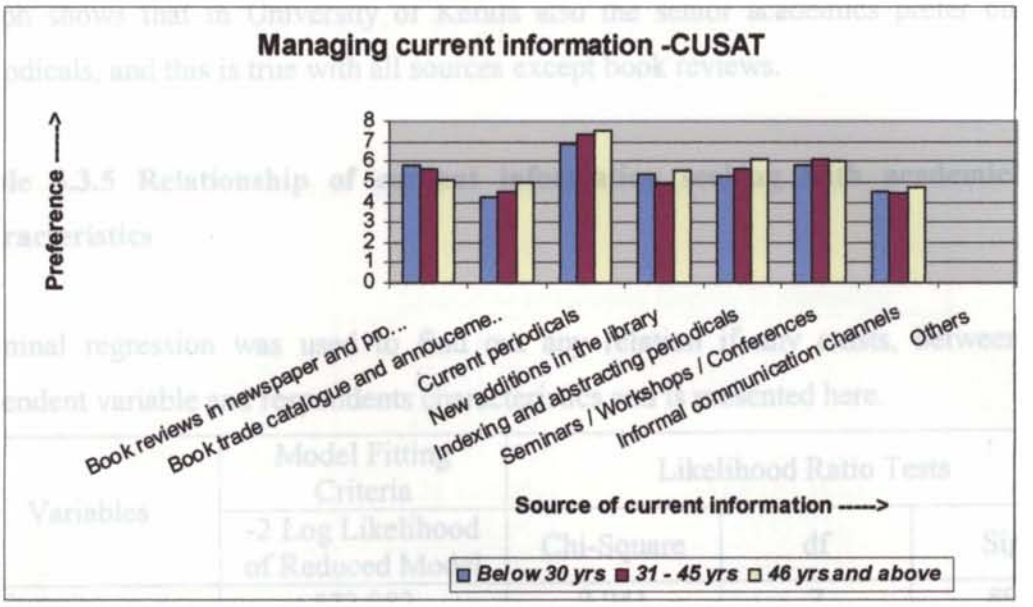


Graph 4.3.5 Method of collecting current information

Graph 4.3.5 provides comparative picture of how academics gather current information. In order to get updated with the recent developments in the respective fields, academics choose current periodicals as their main source; this is followed by seminar /workshops/ conferences for the academics of CUSAT, and book reviews and professional periodicals for academics of University of Kerala.

4.3.5.1 Method of collecting current information Vs Age

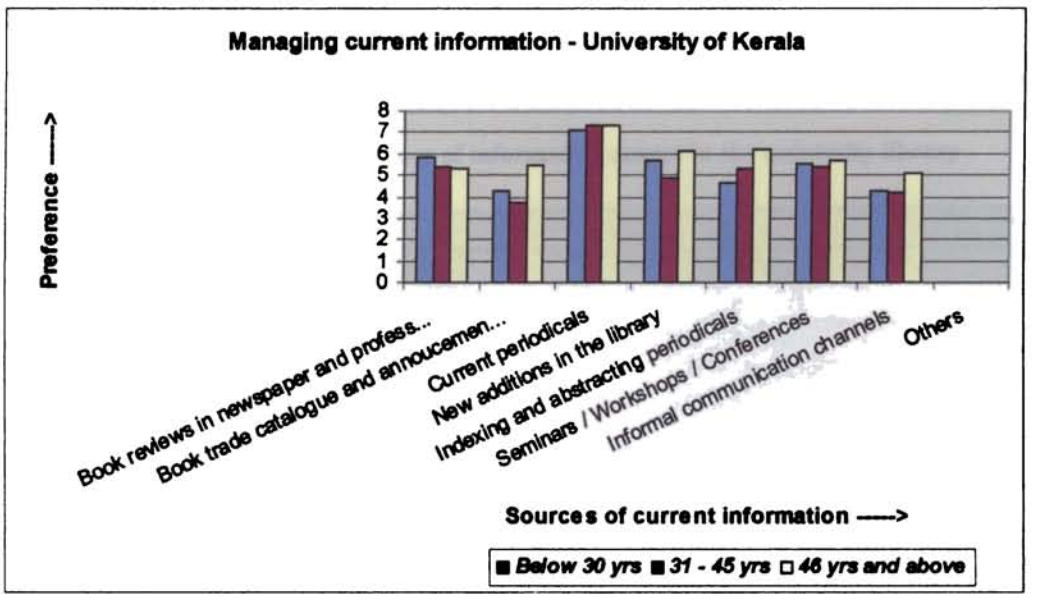
4.3.5.1 Method of collecting current information Vs Age - CUSAT



Graph 4.3.5.1 Method of collecting current information Vs Age – CUSAT

Above graph shows the age wise preference of the academics of CUSAT in seeking current information. From the graph it is evident that academics within the age group 46 and above prefer current periodicals more to other age groups.

4.3.5.2 Method of collecting current information Vs Age – University of Kerala



Graph 4.3.5.2 Method of collecting current information Vs Age – University of Kerala

Graph 4.3.5.2 provides a picture of how academicians manage current information. Graph shows that in University of Kerala also the senior academics prefer current periodicals, and this is true with all sources except book reviews.

Table 4.3.5 Relationship of current information seeking with academician's characteristics

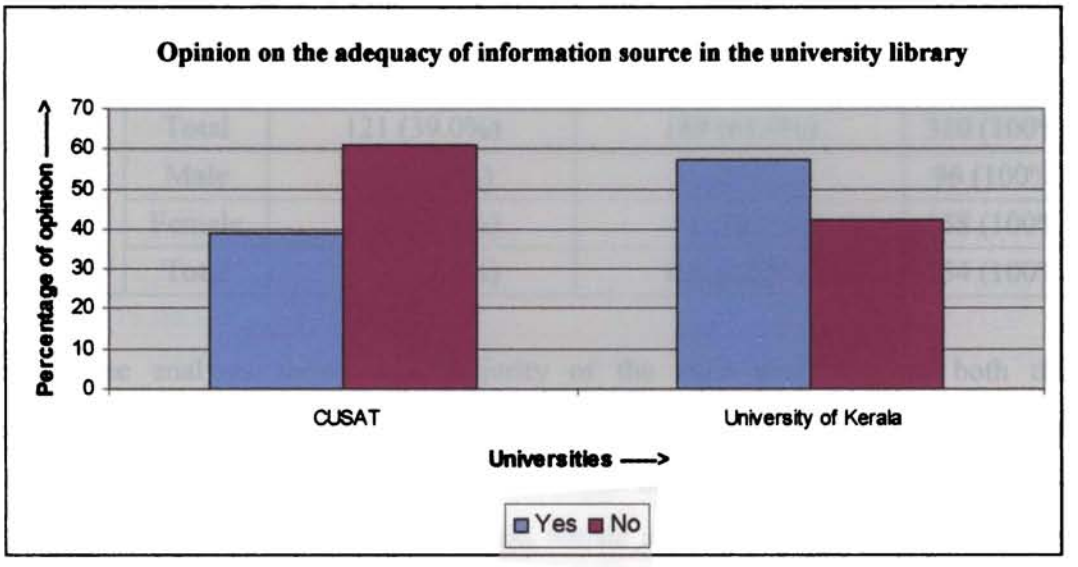
Nominal regression was used to find out any relation if any exists, between the dependent variable and respondents characteristics and is presented here.

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	573.982	2.941	7	.890
Age group	591.659	20.618	14	.112
Gender	576.292	5.251	7	.629
Qualification(s)	620.028	48.987	28	.008
Category	601.698	30.657	28	.333
Discipline	574.746	3.705	7	.813

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Table 4.3.5 shows that qualification has an effect on the dependent variable.

4.3.6 Opinion on the adequacy of information source in the university library



Graph 4.3.6 Opinion on the adequacy of information source in the university library

A good number of academics of CUSAT (61.0%) are of the opinion that the source in the university library is not adequate, while majority of the academics of University of Kerala viewed that the source offered to them by the university library is adequate.

Table 4.3.6.1 Opinion on the adequacy of information source in the university library Vs Age

		Age Group (Years)	Source in university library is adequate		Total
			Yes	No	
University	CUSAT	Below 30	75 (41.0%)	108 (59.0%)	183 (100%)
		31- 45	29 (35.4%)	53 (64.6%)	82 (100%)
		46 and above	17 (37.8%)	28 (62.2%)	45 (100%)
		Total	121 (39.0%)	189 (61.0%)	310 (100%)
	University of Kerala	Below 30	129 (64.5%)	71 (35.5%)	200 (100%)
		31- 45	14 (36.8%)	24 (63.2%)	38 (100%)
		46 and above	3 (18.8%)	13 (81.2%)	16 (100%)
		Total	146 (57.5%)	108 (42.5%)	254 (100%)

Table 4.3.6.1 shows that in CUSAT, academics with in the age limit 31-45 (64.6%) and in University of Kerala academics with in the age limit 46 and above (81.3%) are more dissatisfied with the available source of the university library.

Table 4.3.6.2 Opinion on the adequacy of information source in the university library Vs Gender

		Gender	Source in university library is adequate		Total
			Yes	No	
University	CUSAT	Male	63 (36.2%)	111 (63.8%)	174 (100%)
		Female	58 (42.6%)	78 (57.4%)	136 (100%)
		Total	121 (39.0%)	189 (61.0%)	310 (100%)
	University of Kerala	Male	45 (46.9%)	51 (53.1%)	96 (100%)
		Female	101 (63.9%)	57 (36.1%)	158 (100%)
		Total	146 (57.5%)	108 (42.5%)	254 (100%)

Gender wise analysis shows that majority of the male academics of both the universities is of the opinion that the source of the university library is not adequate. In CUSAT both male and female academics feels that the source of university library is not adequate, while in University of Kerala female academics feel that the source is adequate.

Table 4.3.6.3 Opinion on the adequacy of information source in the university library Vs Discipline

		Discipline	Source in university library is adequate		Total
			Yes	No	
University	CUSAT	Science	68 (35.8%)	122 (64.2%)	190 (100%)
		Technology	53 (44.2%)	67 (55.8%)	120 (100%)
		Total	121 (39.0%)	189 (61.0%)	310 (100%)
	University of Kerala	Science	107 (56.3%)	83 (43.7%)	190 (100%)
		Technology	39 (60.9%)	25 (39.1%)	64 (100%)
		Total	146 (57.5%)	108 (42.5%)	254 (100%)

Discipline wise analysis shows that in CUSAT majority of the academics of both the disciplines are of the opinion that the source is not sufficient, where-as in University of Kerala, they feel that the source is adequate.

4.3.6.4 Opinion on the adequacy of information source in the university library Vs Category

Table 4.3.6.4.1 Opinion on the adequacy of information source in the university library Vs Teachers

		Category-Teachers	Source in university library is adequate		Total
			Yes	No	
University	CUSAT	Lecturer	25 (35.7%)	45 (64.3%)	70 (100%)
		Reader	12 (41.4%)	17 (58.6%)	29 (100%)
		Professor	4 (19.0%)	17 (81.0%)	21 (100%)
		Total	41 (34.2%)	79 (65.8%)	120 (100%)
	University of Kerala	Lecturer	18 (46.2%)	21 (53.8%)	39 (100%)
		Reader	3 (27.3%)	8 (72.7%)	11 (100%)
		Professor	1 (20.0%)	4 (80.0%)	5 (100%)
		Total	22 (40.0%)	33 (60.0%)	55 (100%)

Teachers wise analysis shows that majority of the teachers of both the universities consider that the source of the library is not sufficient, and among the categories of teachers- Professors are the most dissatisfied group. More than 80% of the Professors of the universities are of the opinion that the source offered by the university library is inadequate.

Table 4.3.6.4.2 Opinion on the adequacy of information source in the university library Vs Research scholar

		Category-Researchers	Source in university library is adequate		Total
			Yes	No	
University	CUSAT	Ph.D	67 (40.4%)	99 (59.6%)	166 (100%)
		M.Phil	13 (54.2%)	11 (45.8%)	24 (100%)
		Total	80 (42.1%)	110 (57.9%)	190 (100%)
	University of Kerala	Ph.D	63 (51.6%)	59 (48.4%)	122 (100%)
		M.Phil	61 (79.2%)	16 (20.8%)	77 (100%)
		Total	124 (62.3%)	75 (37.7%)	199 (100%)

Research scholar wise analysis shows that majority of the research scholars of CUSAT feels that the source in university library is not sufficient, and among them Ph.D scholars are the most dissatisfied group. In University of Kerala, both categories of research scholars are contented with the source of the university library.

Table 4.3.6 Relationship of adequacy of information sources with academician's characteristics

Adequacy of resources of both the universities is statistically verified in relation to various variables using logistic regression.

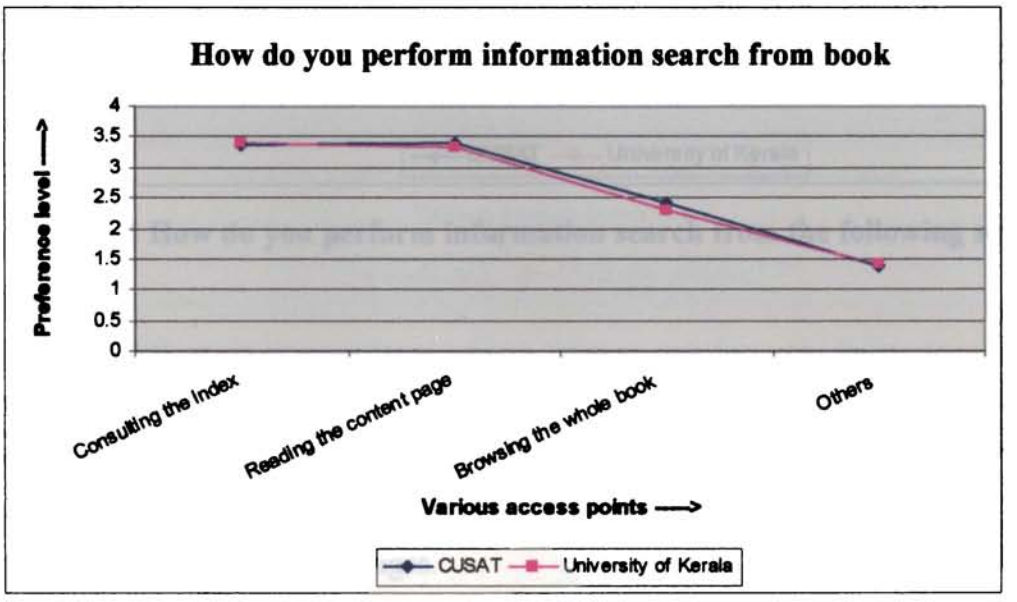
Variables	B	S.E.	Wald	df	Sig.	Exp(B)
University	-.661	.185	12.748	1	.000	.516
Age group	.102	.159	.411	1	.521	1.108
Gender	-.385	.184	4.389	1	.036	.681
Qualification	.106	.044	5.774	1	.016	1.112
Category	-.309	.090	11.728	1	.001	.734
Discipline	-.477	.219	4.752	1	.029	.621

Table 4.3.6 reveals that adequacy of source is highly significant with institution. Table also proves that variables like category, qualification, discipline and gender of academics have an impact on the adequacy of information resources.

4.3.7 How do you perform information search from the following sources

A comparative outlook of how the academics seek information from various sources is presented in the following graphs. Graph exhibits similar information search behaviour among the academics of both the universities. Academics choose subject index as their chief access point for seeking information from different sources. Suriya (Suriya, et al., 2004) also provided a similar finding.

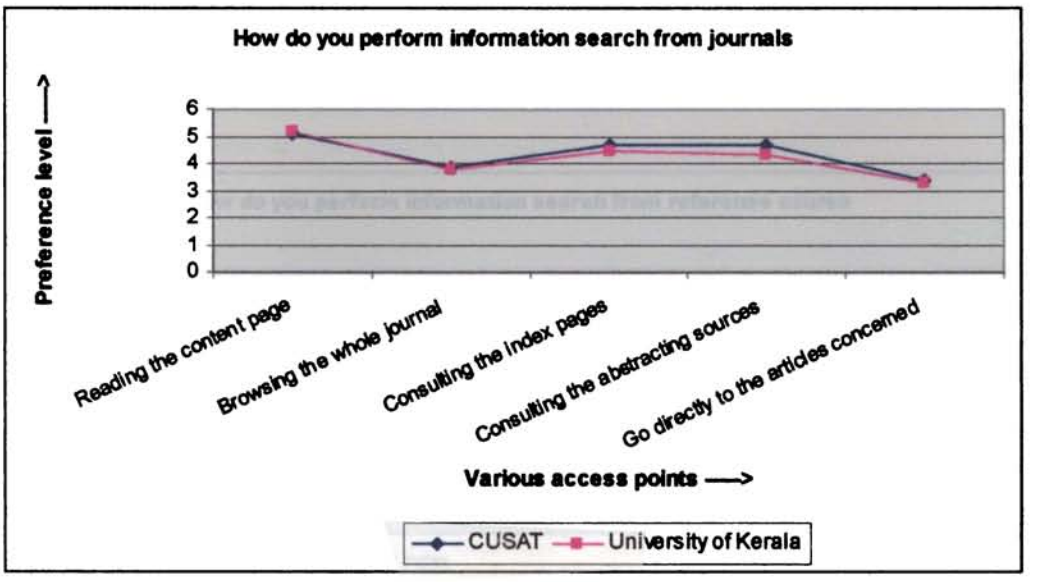
4.3.7.1 How do you perform information search from the following sources - Book



Graph 4.3.7.1 How do you perform information search from the following sources - Book

Graph 4.3.7.1 illustrates how the academics seek information from book. An almost similar behaviour of information gathering among the academics is evident from the graph. Academics of CUSAT prefer content page, while index is the main preferred access point for academics of University of Kerala.

4.3.7.2 How do you perform information search from the following sources – Journals



Graph 4.3.7.2 How do you perform information search from the following sources - Journals

A comparative scrutiny of academics information gathering behaviour of journals is demonstrated in graph 4.3.7.2. Here also a similar pattern of information gathering behaviour is visible from graph. The academics choose content page as their chief access point followed by index pages.

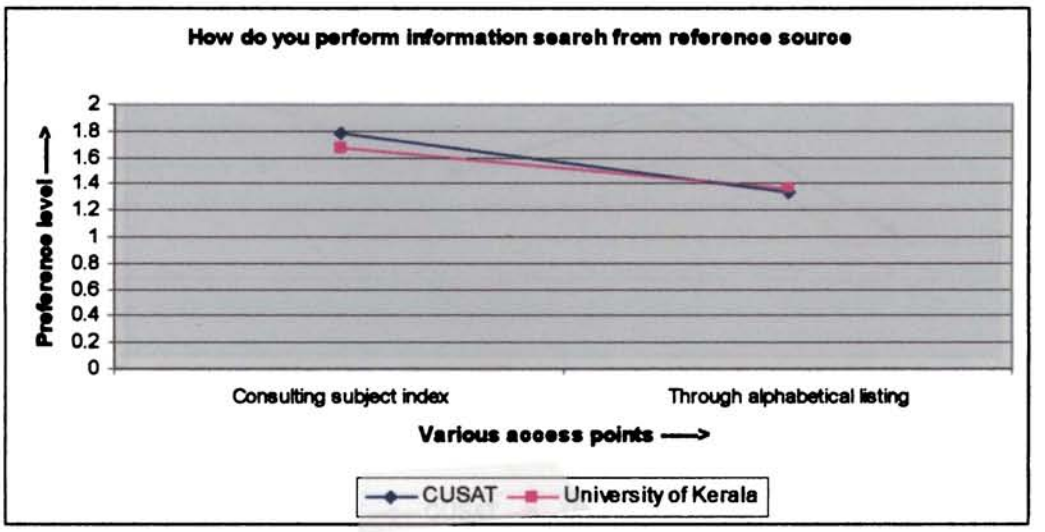
Table 4.3.7.2 Relationship of information navigation through journals with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	560.640	7.969	4	.093
Age group	565.030	12.359	8	.136
Gender	552.807	.135	4	.998
Qualification(s)	566.152	13.480	16	.637
Category	583.699	31.028	16	.013
Discipline	557.570	4.898	4	.298

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Nominal regression was used to find out any relation if any there exists between the dependent variable and respondents characteristics and is presented in Table 4.3.7.2. Table shows that category has an effect on the dependent variable.

4.3.7.3 How do you perform information search from the following sources – Reference source



Graph 4.3.7.3 How do you perform information search from the following sources - Reference source

Graph 4.3.7.3 illustrates a comparative picture of academics information seeking pattern from reference sources. Subject index is the most preferred access point by the academics, and in the case of reference source also a similar trend of behaviour is visible.

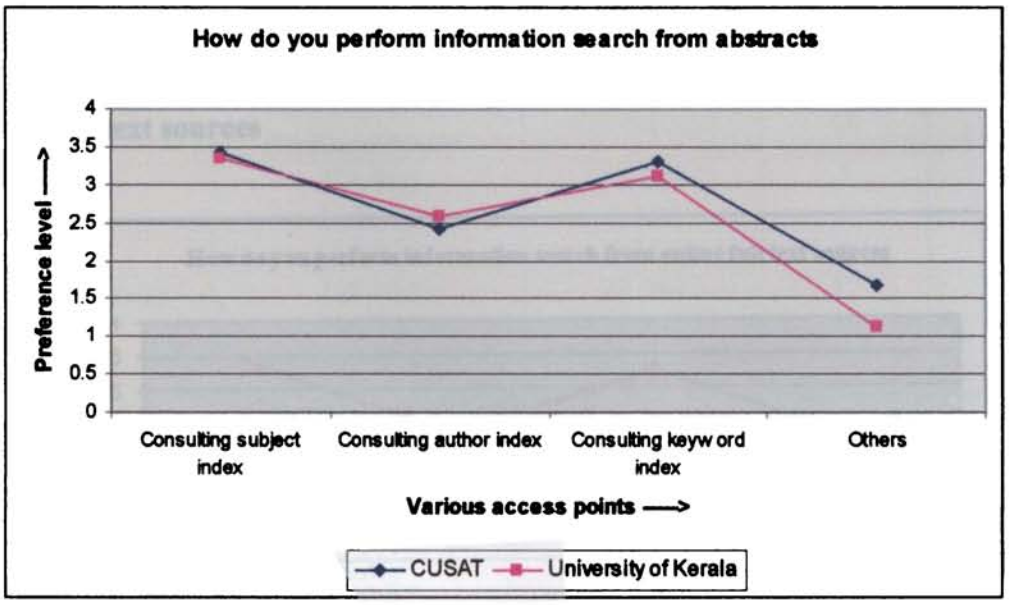
Table 4.3.7.3 Relationship of information search in reference sources with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	182.445	.086	1	.769
Age group	184.827	2.468	2	.291
Gender	182.367	.007	1	.931
Qualification(s)	185.691	3.331	4	.504
Category	194.919	12.560	4	.014
Discipline	183.984	1.625	1	.202

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Nominal regression was used to find out any relation if any, between the dependent variable and respondents characteristics and is presented here. From table 4.3.7.3 it is evident that there exists a relation between category and the dependent variable.

4.3.7.4 How do you perform information search from the following sources – Abstracts



Graph 4.3.7.4 How do you perform information search from the following sources – Abstracts

A comparative analysis of information gathering from abstracts is presented in the graph 4.3.7.4. Here also a similar pattern of information search behaviour among the academics is evident from graph. The main access point for academics is subject index, followed by keyword index.

Table 4.3.7.4 Relationship of dependent variable with academics' characteristics

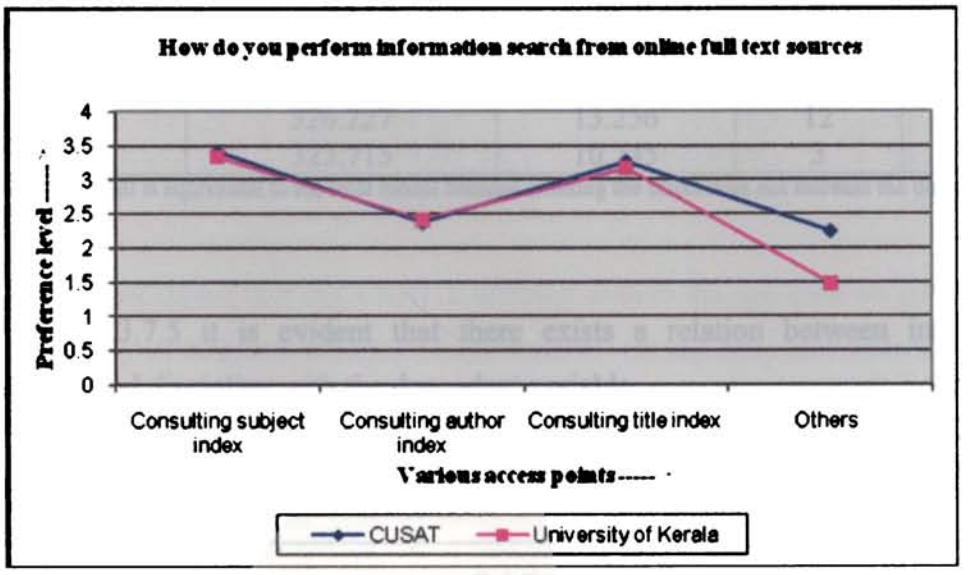
Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	326.133	10.956	3	.012
Age group	322.874	7.698	6	.261
Gender	315.611	.434	3	.933
Qualification(s)	332.424	17.248	12	.141
Category	346.194	31.018	12	.002
Discipline	317.771	2.595	3	.458

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Nominal regression was used to find out any relation if any, between the dependent variable and respondents characteristics and is presented here.

From table 4.3.7.4 it is evident that there exists a relation between university and category with the dependent variable.

4.3.7.5 How do you perform information search from the following sources – Online full text sources



Graph 4.3.7.5 How do you perform information search from the following sources - Online full text sources

Graph 4.3.7.5 provides a comparative picture of how academics search information from online full text sources. Similar pattern of information search among academics of both the universities is evident from the graph. Graph shows that academics prefer subject index followed by title index for getting information from online sources.

Table 4.3.7.5 Relationship of information search through full text sources with academics' characteristics

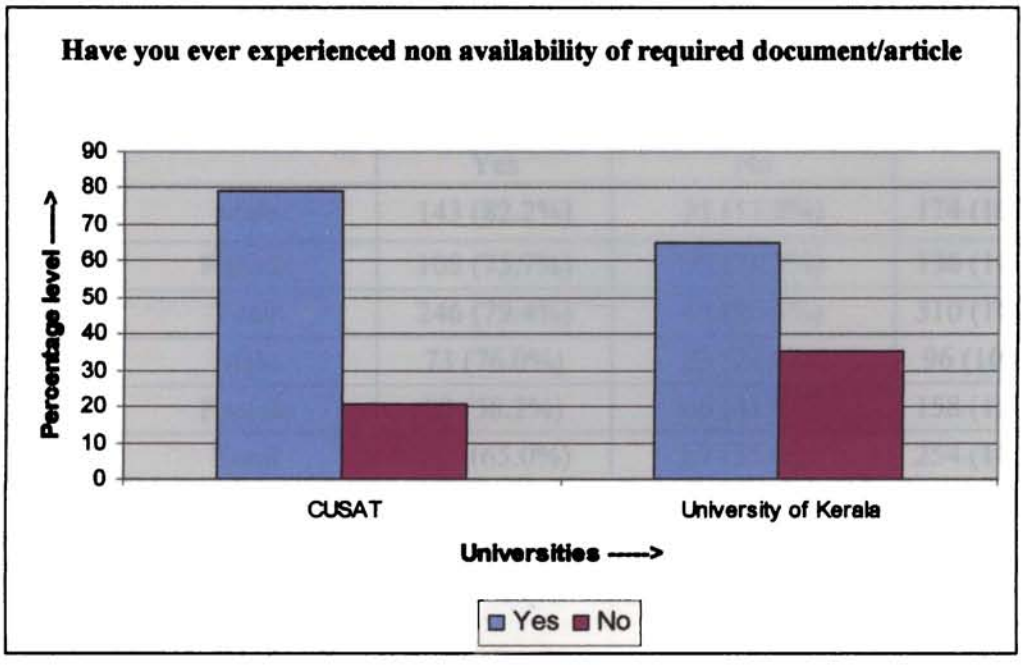
Nominal regression was used to find out any relation if any exists between the dependent variable and respondents characteristics and is presented here.

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	323.966	10.995	3	.012
Age group	318.411	5.440	6	.489
Gender	319.224	6.254	3	.100
Qualification(s)	336.015	23.044	12	.027
Category	326.227	13.256	12	.351
Discipline	323.715	10.745	3	.013

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

From table 4.3.7.5 it is evident that there exists a relation between institution, qualification and discipline with the dependent variable.

4.3.8 Experience of non availability of required document/article



Graph 4.3.8 Experience of non availability of required document/article

Graph 4.3.8 demonstrates academics' experience of the non availability of information. From graph it is apparent that a good number of academics of both the universities experienced non availability of information, and such experience is higher in CUSAT.

Table 4.3.8.1 Experience of non availability of required document/article Vs Age

		Age group (Years)	Ever experienced non availability of required document/article		Total
			Yes	No	
University	CUSAT	Below 30	143 (78.1%)	40 (21.9%)	183 (100%)
		31- 45	64 (78.0%)	18 (22.0%)	82 (100%)
		46 and above	39 (86.7%)	6 (13.3%)	45 (100%)
		Total	246 (79.4%)	64 (20.6%)	310 (100%)
	University of Kerala	Below 30	121 (60.5%)	79 (39.5%)	200 (100%)
		31- 45	31 (81.6%)	7 (18.4%)	38 (100%)
		46 and above	13 (81.2%)	3 (18.8%)	16 (100%)
		Total	165 (65.0%)	89 (35.0%)	254 (100%)

Age wise analysis shows that in CUSAT academics with in the age limit 46 and above and in University of Kerala academics of age limit 31-45, experienced non availability of required information more than academics of other age groups.

Table 4.3.8.2 Experience of non availability of required document/article Vs Gender

		Gender	Ever experienced non availability of required document/article		Total
			Yes	No	
University	CUSAT	Male	143 (82.2%)	31 (17.8%)	174 (100%)
		Female	103 (75.7%)	33 (24.3%)	136 (100%)
		Total	246 (79.4%)	64 (20.6%)	310 (100%)
	University of Kerala	Male	73 (76.0%)	23 (24.0%)	96 (100%)
		Female	92 (58.2%)	66 (41.8%)	158 (100%)
		Total	165 (65.0%)	89 (35.0%)	254 (100%)

Gender wise analysis is shown in the table 4.3.8.2, and from table it is obvious that in both the universities, male academics experienced non availability of required information more.

Table 4.3.8.3 Experience of non availability of required document/article Vs Discipline

		Discipline	Ever experienced non availability of required document/article		Total
			Yes	No	
University	CUSAT	Science	148 (77.9%)	42 (22.1%)	190 (100%)
		Technology	98 (81.7%)	22 (18.3%)	120 (100%)
		Total	246 (79.4%)	64 (20.6%)	310 (100%)
	University of Kerala	Science	128 (67.4%)	62 (32.6%)	190 (100%)
		Technology	37 (57.8%)	27 (42.2%)	64 (100%)
		Total	165 (65.0%)	89 (35.0%)	254 (100%)

Table 4.3.8.3 presents discipline wise analysis of the academics experience on the non availability of required document/article. Discipline wise analysis shows that in CUSAT, academics belonging to technology disciplines and in University of Kerala academics from science disciplines experienced non availability of required document/article more.

4.3.8.4 Experience of non availability of required document/article Vs Category

Table 4.3.8.4.1 Experience of non availability of required document/article Vs Teachers

		Category- Teachers	Ever experienced non availability of required document/article		Total
			Yes	No	
University	CUSAT	Lecturer	54 (77.1%)	16 (22.9%)	70 (100%)
		Reader	27 (93.1%)	2 (6.9%)	29 (100%)
		Professor	19 (90.5%)	2 (9.5%)	21 (100%)
		Total	100 (83.3%)	20 (16.7%)	120 (100%)
	University of Kerala	Lecturer	27 (69.2%)	12 (30.8%)	39 (100%)
		Reader	8 (72.7%)	3 (27.3%)	11 (100%)
		Professor	3 (60.0%)	2 (40.0%)	5 (100%)
		Total	38 (69.1%)	17 (30.9%)	55 (100%)

Table 4.3.8.4.1 reveals teachers experience of non availability of required document / article in both universities. Teachers' category wise analysis shows that, Readers of both the universities experienced non availability of required information more.

Table 4.3.8.4.2 Experience of non availability of required document/article Vs Research scholars

		Category-Researchers	Ever experienced non availability of required document/article		Total
			Yes	No	
University	CUSAT	Ph.D	126 (75.9%)	40 (24.1%)	166 (100%)
		M.Phil	20 (83.3%)	4 (16.7%)	24 (100%)
		Total	146 (76.8%)	44 (23.2%)	190 (100%)
	University of Kerala	Ph.D	86 (70.5%)	36 (29.5%)	122 (100%)
		M.Phil	41 (53.2%)	36 (46.8%)	77 (100%)
		Total	127 (63.8%)	72 (36.2%)	199 (100%)

Research scholars experience on non availability of required document / article is tabulated in the table 4.3.8.4.2. Table shows that in CUSAT, M.Phil scholars and in University of Kerala, Ph.D scholars experienced more non availability of required document/article.

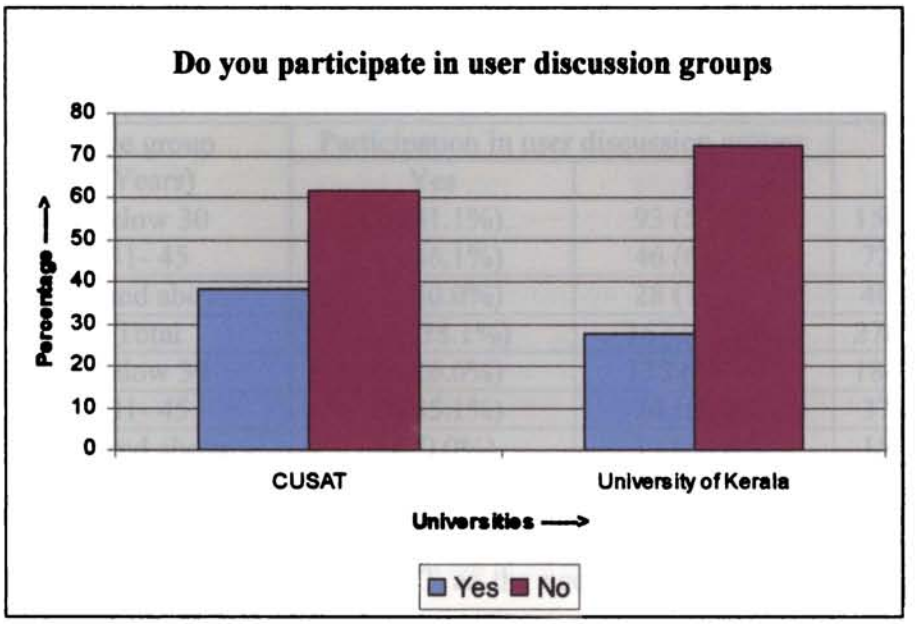
Table 4.3.8 Relationship of non availability of documents with academics' characteristics

The significance of academics characteristics on the non-availability of required documents was statistically analysed using logistic regression and is presented below.

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
University	.643	.205	9.858	1	.002	1.902
Age Group	-.208	.190	1.199	1	.274	.812
Gender	.544	.207	6.932	1	.008	1.722
Qualification	-.130	.049	7.144	1	.008	.878
Category	.134	.100	1.816	1	.178	1.144
Discipline	.021	.247	.007	1	.933	1.021

Statistical analysis establishes the fact that institution has a prominent role in academics experience on the non availability of required documents. Variables like gender, and qualification have an effect on the non availability of required documents.

4.3.9 Participation in user discussion groups



Graph 4.3.9 Participation in user discussion groups

Graph 4.3.9 reveals academics participation in user discussion forums through internet. From the graph it is obvious that user discussion groups over the internet are not widely used by the academics in both the universities. Inference from the graph 4.4.19.B upheld the findings.

Table 4.3.9.1 Participation in user discussion groups Vs Discipline

		Discipline	Participation in user discussion groups		Total
			Yes	No	
University	CUSAT	Science	68 (37.6%)	113 (62.4%)	181 (100%)
		Technology	35 (39.3%)	54 (60.7%)	89 (100%)
		Total	103 (38.1%)	167 (61.9%)	270 (100%)
	University of Kerala	Science	55 (30.4%)	126 (69.6%)	181 (100%)
		Technology	10 (18.2%)	45 (81.8%)	55 (100%)
		Total	65 (27.5%)	171 (72.5%)	236 (100%)

Even though academics are inclined to the electronic media, majority of the academics of both the universities do not seek information through user discussion group in their concerned area of interest for their information needs. Discipline wise analysis shows that majority of the science academics (62.4%) in CUSAT and technology academics (81.8%) in University of Kerala are not using user discussion groups.

Table 4.3.9.2 Participation in user discussion group Vs Age

		Age group (Years)	Participation in user discussion groups		Total
			Yes	No	
University	CUSAT	Below 30	65 (41.1%)	93 (58.9%)	158 (100%)
		31- 45	26 (36.1%)	46 (63.9%)	72 (100%)
		46 and above	12 (30.0%)	28 (70.0%)	40 (100%)
		Total	103 (38.1%)	167 (61.9%)	270 (100%)
	University of Kerala	Below 30	49 (26.6%)	135 (73.4%)	184 (100%)
		31- 45	13 (35.1%)	24 (64.9%)	37 (100%)
		46 and above	3 (20.0%)	12 (80.0%)	15 (100%)
		Total	65 (27.5%)	171 (72.5%)	236 (100%)

Age wise analysis shows that, in CUSAT as the age increases the tendency to seek information through user discussion forums on the internet also decreases. In University of Kerala there is no such relation between age and the mode of seeking information through user discussion forum through internet.

4.3.9.3 Participation in user discussion group Vs Category

Table 4.3.9.3.1 Participation in user discussion group Vs Category of Teachers

		Category- Teachers	Participation in user discussion groups		Total
			Yes	No	
University	CUSAT	Lecturer	22 (36.1%)	39 (63.9%)	61 (100%)
		Reader	10 (38.5%)	16 (61.5%)	26 (100%)
		Professor	4 (22.2%)	14 (77.8%)	18 (100%)
		Total	36 (34.3%)	69 (65.7%)	105 (100%)
	University of Kerala	Lecturer	7 (20.6%)	27 (79.4%)	34 (100%)
		Reader	3 (27.3%)	8 (72.7%)	11 (100%)
		Professor	1 (20.0%)	4 (80.0%)	5 (100%)
		Total	11 (22.0%)	39 (78.0%)	50 (100%)

Majority of the teachers of the universities, 65.7% in CUSAT and 78% in University of Kerala do not use user discussion group through internet. Professors of both the universities are more unenthusiastic towards participation in user discussion group.

Table 4.3.9.3.2 Participation in user discussion group Vs Category of Researchers

		Category-Researchers	Participation in user discussion groups		Total
			Yes	No	
University	CUSAT	Ph.D	58 (40.6%)	85 (59.4%)	143 (100%)
		M.Phil	9 (40.9%)	13 (59.1%)	22 (100%)
		Total	67 (40.6%)	98 (59.4%)	165 (100%)
	University of Kerala	Ph.D	30 (25.9%)	86 (74.1%)	116 (100%)
		M.Phil	24 (34.3%)	46 (65.7%)	70 (100%)
		Total	54 (29.0%)	132 (71.0%)	186 (100%)

Research scholar wise analysis of academics participation in the user discussion forums was carried out and is tabulated in 4.3.9.3.2. Table shows that majority of the research scholars do not participate in the user discussion forums on internet for seeking information.

Table 4.3.9.4 Participation in user discussion groups Vs Gender

		Gender	Participation in user discussion groups		Total
			Yes	No	
University	CUSAT	Male	64 (41.6%)	90 (58.4%)	154 (100%)
		Female	39 (33.6%)	77 (66.4%)	116 (100%)
		Total	103 (38.1%)	167 (61.9%)	270 (100%)
	University of Kerala	Male	29 (31.5%)	63 (68.5%)	92 (100%)
		Female	36 (25.0%)	108 (75.0%)	144 (100%)
		Total	65 (27.5%)	171 (72.5%)	236 (100%)

Gender wise analysis shows that in both the universities, female academics are more reluctant to use user discussion forums on internet for seeking information.

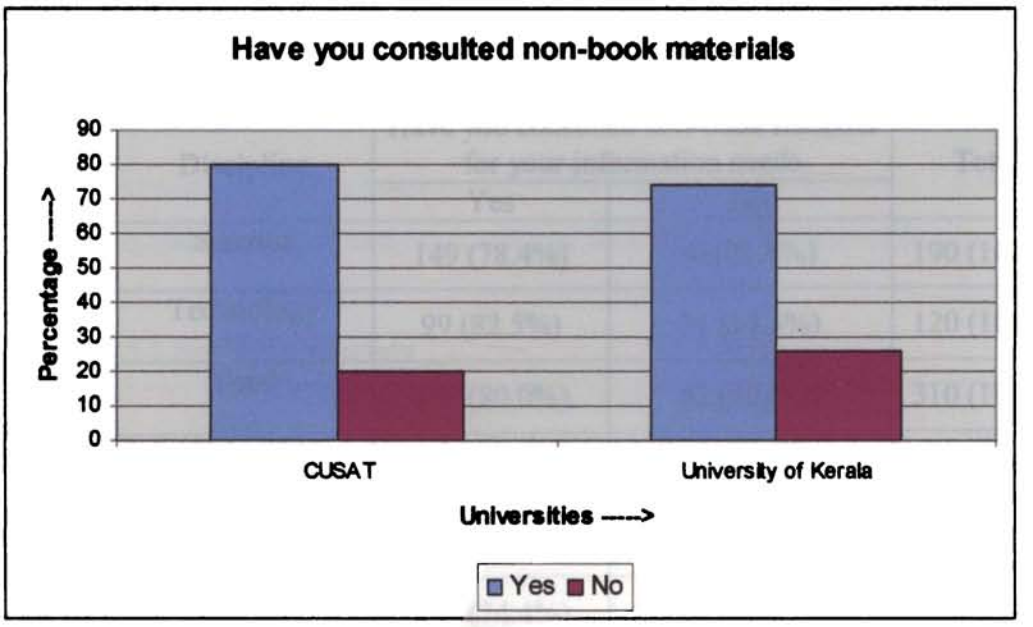
Table 4.3.9 Relationship of participation in user discussion groups with academics' characteristics

Academics participation in user discussion forums is tested for any significance with user characteristics using logistic regression and is presented in the table 4.3.9.

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
University	.531	.203	6.840	1	.009	1.701
Age Group	.127	.174	.536	1	.464	1.136
Gender	.450	.203	4.910	1	.027	1.568
Qualification	-.031	.050	.381	1	.537	.970
Category	-.078	.097	.648	1	.421	.925
Discipline	.118	.242	.237	1	.626	1.125

From table 4.3.9, it is evident that university and gender have an effect on academics participation in user discussion groups.

4.3.10 Non-book material consultation



Graph 4.3.10 Have you consulted non-book materials for information needs

Graph 4.3.10 provides a comparison of the usage of non-book materials by the academicians of both universities. From graph it is clear that majority of the academics

are using non-book materials for their information needs. Non-book materials are consulted more often in CUSAT (80.0%), than in University of Kerala (74.4%).

Table 4.3.10.1 Have you consulted non-book materials for information needs Vs Gender

		Gender	Have you consulted non-book material for your information needs		Total
			Yes	No	
University	CUSAT	Male	139 (79.9%)	35 (20.1%)	174 (100%)
		Female	109 (80.1%)	27 (19.9%)	136 (100%)
		Total	248 (80.0%)	62 (20.0%)	310 (100%)
	University of Kerala	Male	67 (69.8%)	29 (30.2%)	96 (100%)
		Female	122 (77.2%)	36 (22.8%)	158 (100%)
		Total	189 (74.4%)	65 (25.6%)	254 (100%)

Academics non-book material usage is studied gender wise and is presented in the table 4.3.10.1. Table shows that female academics of both the universities are using non-book materials more frequently than male academics.

Table 4.3.10.2 Have you consulted non-book materials for information needs Vs Discipline

		Discipline	Have you consulted non-book material for your information needs		Total
			Yes	No	
University	CUSAT	Science	149 (78.4%)	41(21.6%)	190 (100%)
		Technology	99 (82.5%)	21 (17.5%)	120 (100%)
		Total	248 (80.0%)	62 (20.0%)	310 (100%)
	University of Kerala	Science	147 (77.4%)	43 (22.6%)	190 (100%)
		Technology	42 (65.6%)	22 (34.4%)	64(100%)
		Total	189 (74.4%)	65 (25.6%)	254 (100%)

Above table reveals that technology academics in CUSAT and science academics in University of Kerala are consulting non-book materials more for their information requirements.

4.3.10.3 Have you consulted non-book materials for information needs Vs Category

Category wise non-book material consultation was examined and is presented here.

Table 4.3.10.3.1 Teachers

		Category- Teachers	Have you consulted non-book material for your information needs		Total
			Yes	No	
University	CUSAT	Lecturer	53 (75.7%)	17 (24.3%)	70 (100%)
		Reader	25 (86.2%)	4 (13.8%)	29 (100%)
		Professor	17 (81.0%)	4 (19.0%)	21 (100%)
		Total	95 (79.2%)	25 (20.8%)	120 (100%)
	University of Kerala	Lecturer	23 (59.0%)	16 (41.0%)	39 (100%)
		Reader	8 (72.7%)	3 (27.3%)	11 (100%)
		Professor	4 (80.0%)	1 (20.0%)	5 (100%)
		Total	35 (63.6%)	20 (36.4%)	55 (100%)

Above table reveals that 86.2% Readers in CUSAT and 80.0% Professors in University of Kerala have often consulted non-book material for their information needs.

Table 4.3.10.3.2 Research scholars

		Category- Researchers	Have you consulted non-book material for your information needs		Total
			Yes	No	
University	CUSAT	Ph.D	135 (81.3%)	31 (18.7%)	166 (100%)
		M.Phil	18 (75.0%)	6 (25.0%)	24 (100%)
		Total	153 (80.5%)	37 (19.5%)	190 (100%)
	University of Kerala	Ph.D	98 (80.3%)	24 (19.7%)	122 (100%)
		M.Phil	56 (72.7%)	21 (27.3%)	77 (100%)
		Total	154 (77.4%)	45 (22.6%)	199 (100%)

Research scholar wise analysis shows that Ph.D scholars of both the universities are using non-book materials more for their information needs. University wise comparison shows that Ph.D scholars of CUSAT are using non-book materials more.

4.3.10.4 Have you consulted non-book materials for information needs Vs Age

		Age group (Years)	Have you consulted non-book material for your information needs		Total
			Yes	No	
University	CUSAT	Below 30	151 (82.5%)	32 (17.5%)	183 (100%)
		31- 45	62 (75.6%)	20 (24.4%)	82 (100%)
		46 and above	35 (77.8%)	10 (22.2%)	45 (100%)
		Total	248 (80.0%)	62 (20.0%)	310 (100%)
	University of Kerala	Below 30	152 (76.0%)	48 (24.0%)	200 (100%)
		31- 45	25 (65.8%)	13 (34.2%)	38 (100%)
		46 and above	12 (75.0%)	4 (25.0%)	16 (100%)
		Total	189 (74.4%)	65 (25.6%)	254 (100%)

Age wise analysis of the non-book material usage is provided in the table 4.3.10.4. Age wise analysis shows that in both the universities, academics with the age limit of below 30 years are consulting non-book materials more than academics of other groups.

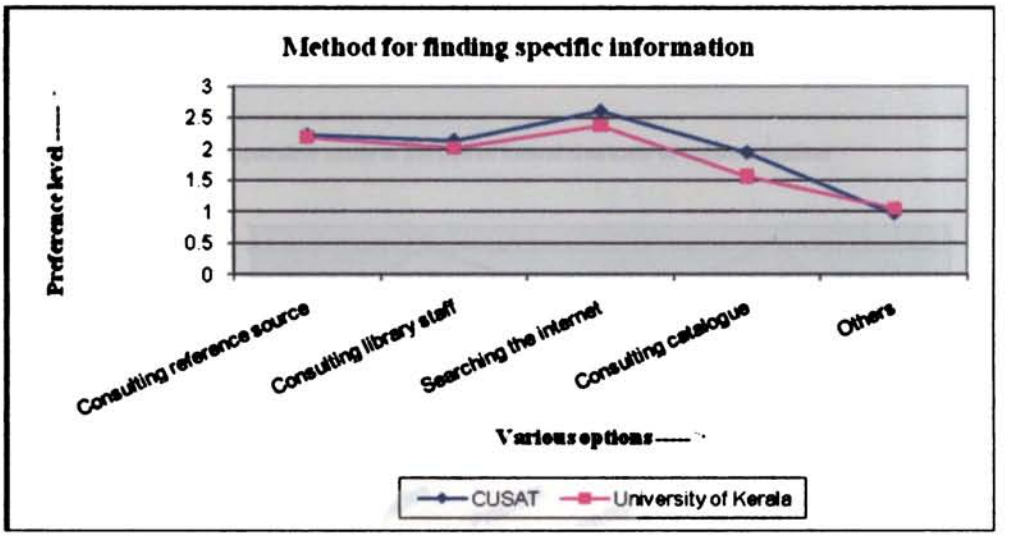
Table 4.3.10 Relationship of non-book consultation with academics characteristics

Logistic regression was used to check the significance of academics non-book consultation with various characteristics and is tabulated in 4.3.10.

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
University	.453	.215	4.426	1	.035	1.573
Age Group	.155	.176	.777	1	.378	1.167
Gender	-.138	.212	.425	1	.514	.871
Qualification	-.046	.048	.898	1	.343	.955
Category	-.045	.096	.217	1	.641	.956
Discipline	-.053	.250	.045	1	.833	.949

Table shows that among various variables only institution has an influence on academics' non book consultation.

4.3.11 Method of finding specific information



Graph 4.3.11 Method of finding specific information

Academics customary method of finding specific information is examined and presented in the graph 4.3.11. The bench mark is 2.5 and from graph it is clear that academics prefer internet as their major source for finding specific information. They use reference source also for getting specific information.

Table 4.3.11 Relationship of method of finding specific information with academics characteristics

Nominal regression was used to find out any relation if any exists between the dependent variable and respondents characteristics and is presented here.

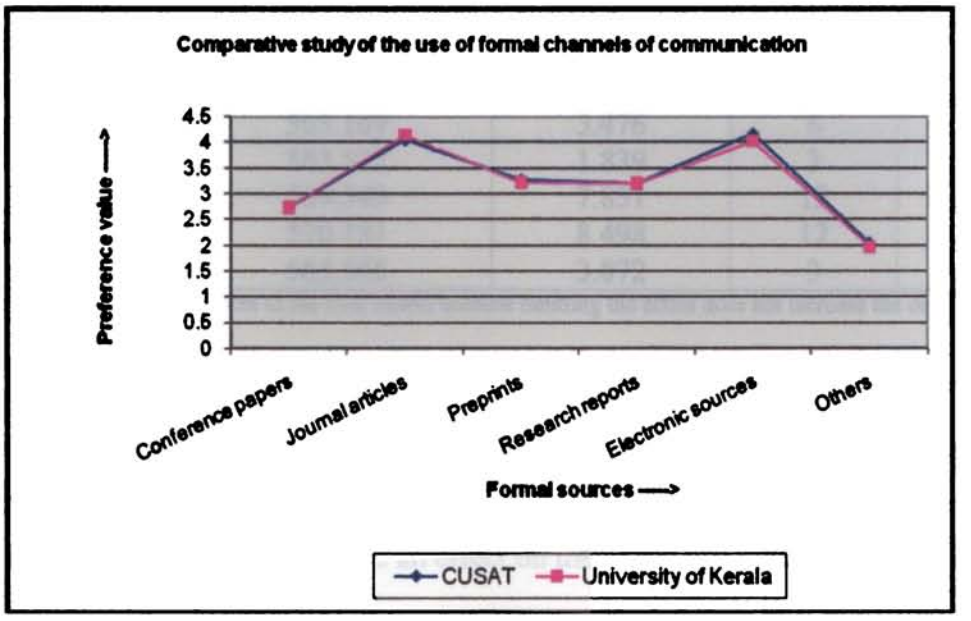
Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	599.623	8.791	3	.032
Age group	601.246	10.414	6	.108
Gender	591.191	.360	3	.948
Qualification(s)	599.337	8.506	12	.744
Category	604.510	13.679	12	.322
Discipline	592.842	2.010	3	.570

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

From table 4.3.11 it is clear that institution has an impact on the dependent variable.

4.3.12 Channels of communication 123

4.3.12.1 Channels of communication – Formal



Graph 4.3.12.1 Channels of communication – Formal

Academics preferences of the formal channels of communication were examined and are diagrammatically presented here. The bench mark is 3 and sources which have got a preference value equal to or more than three are preferred sources. Graph 4.3.12.1 shows that among various channels of communication, electronic source was consulted more frequently followed by journal articles. The usage trend among formal source is quite similar among academics of both the universities. The finding is in conformity with the inference deduced in graph 4.3.1. Hence we can infer that academics are more inclined towards electronic resources.

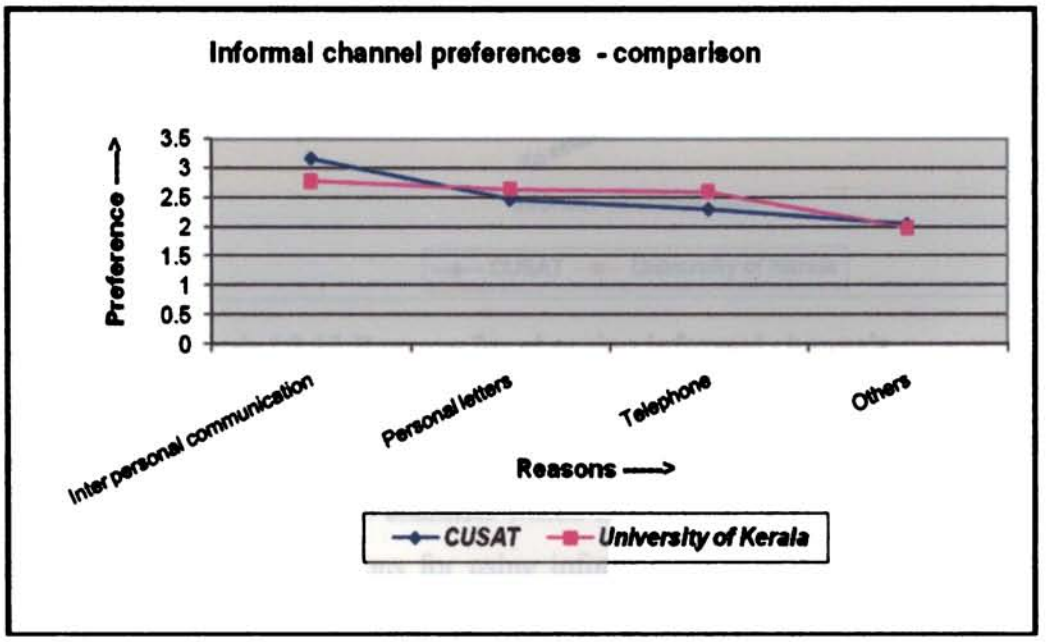
Table 4.3.12.1 Relationship of formal channels of communication with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	580.148	18.456	3	.000
Age group	565.169	3.476	6	.747
Gender	563.532	1.839	3	.607
Qualification(s)	569.543	7.851	12	.797
Category	570.191	8.498	12	.745
Discipline	565.565	3.872	3	.276

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Nominal regression was used to find out there exists any relation if any, between the dependent variable and respondents characteristics and is presented here. From table 4.3.12.1 it is clear that university has an effect on the dependent variable.

4.3.12.2 Channels of communication –Informal



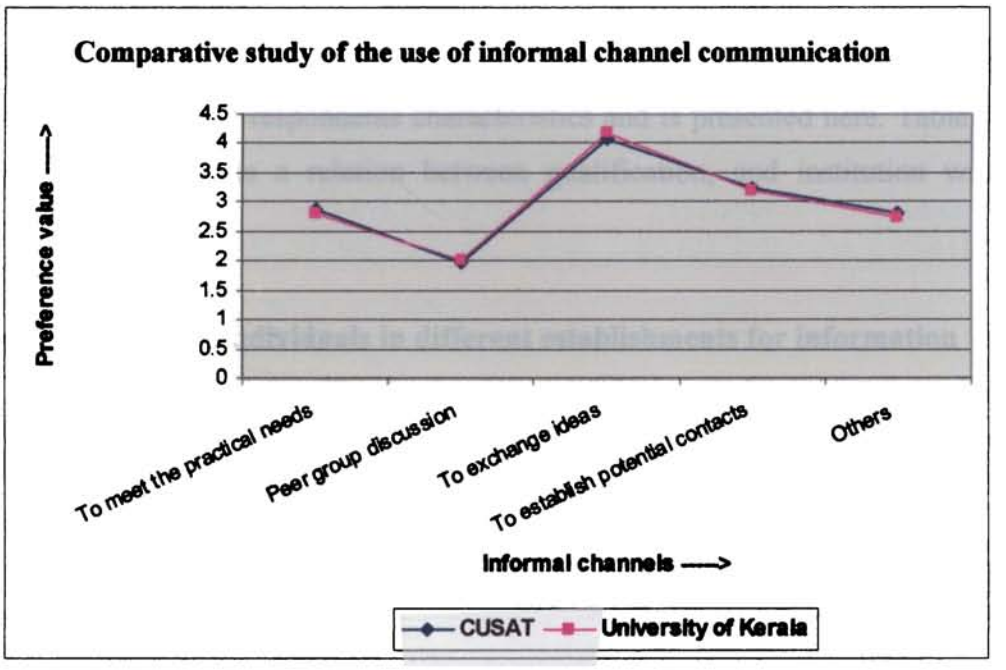
Graph 4.3.12.2 Channels of communication – Informal

Informal channel usage of the academics was studied and is presented in the graph 4.3.12.2. Here the preference level is 2, and all the major channels have got higher

value. From the above graph it is evident that, academics of both the universities use informal channels of communication mainly by interpersonal communication, and the use pattern of informal communication channels differ slightly among academics.

Graph 4.3.12.1 and graph 4.3.12.2 shows that academics of the universities use both formal and informal channels of communication for satisfying their information requirements. Bigdeli (Bigdeli, 2007), Ucak (Ucak, et al., 1998), Sridhar (Sridhar, 1987) also provides a similar inference.

4.3.13 Reasons for choosing informal channels



Graph 4.3.13 Reasons for choosing informal channels

Above graph illustrates the reasons of academics in choosing the informal channels. The bench mark is 2.5 and the channels which have got a value of more than 2.5 are preferred channels. The reasons for using informal channels are similar among the academics of both the universities. Graph shows that academics prefer to use informal channels primarily for exchanging ideas.

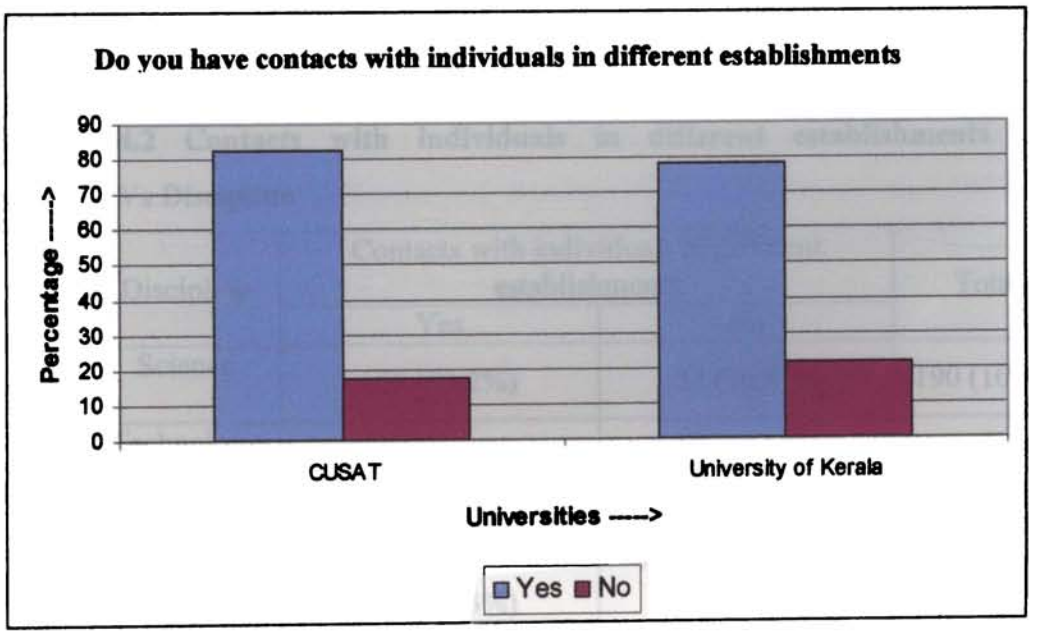
Table 4.3.13 Relationship of reasons for informal channel usage with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	543.546	15.318	4	.004
Age group	537.080	8.852	8	.355
Gender	528.739	.511	4	.972
Qualification(s)	571.720	43.492	16	.000
Category	547.576	19.348	16	.251
Discipline	529.919	1.691	4	.792

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Nominal regression was used to find out any relation if any exists between the dependent variable and respondents characteristics and is presented here. Table 4.3.13 shows that there exists a relation between qualification, and institution with the dependent variable.

4.3.14 Contacts with individuals in different establishments for information



Graph 4.3.14 Contacts with individuals in different establishments for information

Graph 4.3.14 provides a comparative description of academics contacts with individuals in different establishments for exchange of information. Above graph shows that a good majority of the academics, 82.3% in CUSAT and 78.3% in University of Kerala have contacts with individuals in different establishments for exchange of information.

Table 4.3.14.1 Contacts with individuals in different establishments for information Vs Age

		Age Group (Years)	Contacts with individuals in different establishments		Total
			Yes	No	
University	CUSAT	Below 30	142 (77.6%)	41 (22.4%)	183 (100%)
		31- 45	73 (89.0%)	9 (11.0%)	82 (100%)
		46 and above	40 (88.9%)	5 (11.1%)	45 (100%)
		Total	255 (82.3%)	55 (17.7%)	310 (100%)
	University of Kerala	Below 30	151 (75.5%)	49 (24.5%)	200 (100%)
		31- 45	34 (89.5%)	4 (10.5%)	38 (100%)
		46 and above	14 (87.5%)	2 (12.5%)	16 (100%)
		Total	199 (78.3%)	55 (21.7%)	254 (100%)

Above table shows that in both the universities, academics with in the age limit 31-45 have more contacts between individuals in different establishment for exchange of information.

Table 4.3.14.2 Contacts with individuals in different establishments for information Vs Discipline

		Discipline	Contacts with individuals in different establishments		Total
			Yes	No	
University	CUSAT	Science	158 (83.2%)	32 (16.8%)	190 (100%)
		Technology	97 (80.8%)	23 (19.2%)	120 (100%)
		Total	255 (82.3%)	55 (17.7%)	310 (100%)
	University of Kerala	Science	145 (76.3%)	45 (23.7%)	190(100%)
		Technology	54 (84.4%)	10 (15.6%)	64 (100%)
		Total	199 (78.3%)	55 (21.7%)	254 (100%)

Academics contacts with individuals in different establishments were studied and tabulated in 4.3.14.2. Discipline wise analysis shows that in CUSAT, science academics and in University of Kerala, technology academics have more contacts with individuals in different establishment for exchange of information.

4.3.14.3 Contacts with individuals in different establishments for information Vs Category

Table 4.3.14.3.1 Contacts with individuals in different establishments for information Vs Teachers

		Category-Teachers	Contacts with individuals in different establishments		Total
			Yes	No	
University	CUSAT	Lecturer	63 (90.0%)	7 (10.0%)	70 (100%)
		Reader	26 (89.7%)	3 (10.3%)	29 (100%)
		Professor	19 (90.5%)	2 (9.5%)	21(100%)
		Total	108 (90.0%)	12 (10.0%)	120 (100%)
	University of Kerala	Lecturer	32 (82.1%)	7 (17.9%)	39 (100%)
		Reader	11 (100%)	0 (0.0%)	11 (100%)
		Professor	5 (100%)	0 (0.0%)	5 (100%)
		Total	48 (87.3%)	7 (12.7%)	55 (100%)

Category wise analysis of teachers shows that a clear majority of teachers, 90% in CUSAT and 87.3% in University of Kerala have contacts with individuals in different establishments for their information needs. Among them Professors, 90.5% in CUSAT and 100% in University of Kerala and Readers 89.7% in CUSAT and 100% in University of Kerala have contacted individuals in different establishments for exchange of information.

Table 4.3.14.3.2 Contacts with individuals in different establishments for information Vs Research scholars

		Category-Researchers	Contacts with individuals in different establishments		Total
			Yes	No	
University	CUSAT	Ph.D	131 (78.9%)	35 (21.1%)	166 (100%)
		M.Phil	16 (66.7%)	8 (33.3%)	24 (100%)
		Total	147 (77.4%)	43 (22.6%)	190 (100%)
	University of Kerala	Ph.D	103 (84.4%)	19 (15.6%)	122 (100%)
		M.Phil	48 (62.3%)	29 (37.7%)	77 (100%)
		Total	151 (75.9%)	48 (24.1%)	199 (100%)

Researcher wise analysis shows that more than three fourth of research scholars i.e. 77.4% in CUSAT and 75.9% in University of Kerala have contacts with individuals in different establishments for their information requirements. Among them Ph.D scholars have more contacts with individuals in different establishments for exchange of information.

Table 4.3.14.4 Contacts with individuals in different establishments for information Vs Gender

		Gender	Contacts with individuals in different establishments		Total
			Yes	No	
University	CUSAT	Male	149 (85.6%)	25 (14.4%)	174 (100%)
		Female	106 (77.9%)	30 (22.1%)	136 (100%)
		Total	255 (82.3%)	55 (17.7%)	310 (100%)
	University of Kerala	Male	78 (81.3%)	18 (18.8%)	96 (100%)
		Female	121 (76.6%)	37 (23.4%)	158 (100%)
		Total	199 (78.3%)	55 (21.7%)	254 (100%)

Gender wise analysis shows that male academics of both the universities have more contacts with individuals in different establishment in different institutions than female academics.

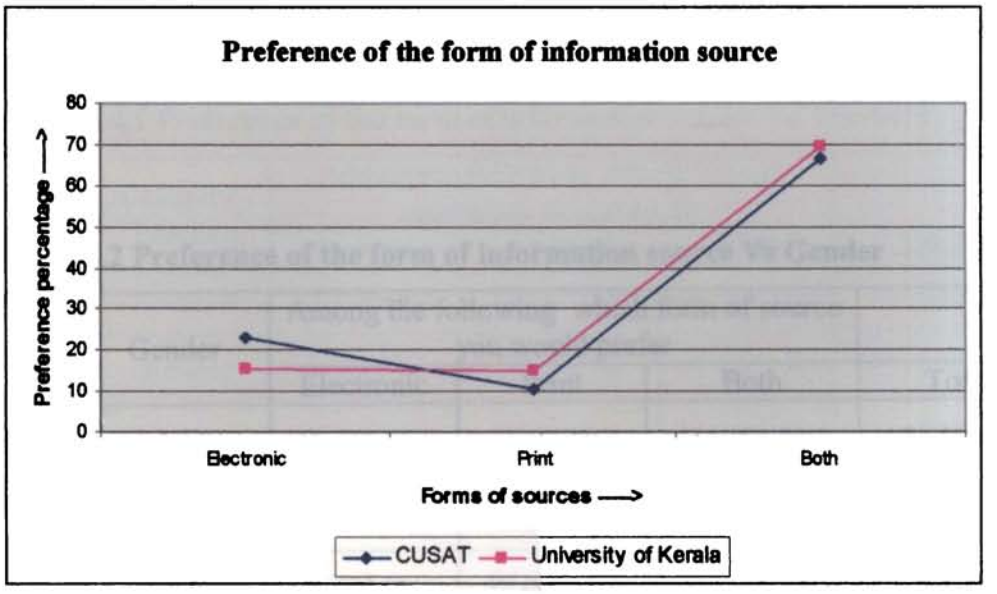
Table 4.3.14 Relationship of contacts with individuals in different establishments with academics' characteristics

The relation between academics contacts with individuals in different institutions with various variables is statistically examined using logistic regression and is presented in table 4.3.14.

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
University	.023	.226	.010	1	.920	1.023
Age Group	-.230	.218	1.109	1	.292	.795
Gender	.252	.228	1.220	1	.269	1.287
Qualification	-.062	.058	1.178	1	.278	.939
Category	.356	.121	8.691	1	.003	1.428
Discipline	.177	.265	.448	1	.503	1.194

Table 4.3.14 shows that there exists category wise significance with the dependent variable.

4.3.15 Preference of the form of information source



Graph 4.3.15 Preference of the form of information source

Graph 4.3.15 depicts academics preference on various forms of sources. From graph it is obvious that a good number of academics of both the universities prefer both print as well as electronic format of source in their library.

Table 4.3.15.1 Preference of the form of information source Vs Age

		Age group (Years)	Among the following which form of source you would prefer			
			Electronic	Print	Both	Total
University	CUSAT	Below 30	47 (25.7%)	16 (8.7%)	120 (65.6%)	183 (100%)
		31 - 45	16 (19.5%)	11 (13.4%)	55 (67.1%)	82 (100%)
		46 yrs and above	8 (17.8%)	5 (11.1%)	32 (71.1%)	45 (100%)
		Total	71 (22.9%)	32 (10.3%)	207 (66.8%)	310 (100%)
	University of Kerala	Below 30	32 (16.0%)	31 (15.5%)	137 (68.5%)	200 (100%)
		31 - 45	4 (10.5%)	3 (7.9%)	31 (81.6%)	38 (100%)
		46 yrs and above	3 (18.8%)	4 (25.0%)	9 (56.3%)	16 (100%)
		Total	39 (15.4%)	38 (15.0%)	177 (69.7%)	254 (100%)

Age wise analysis reveals that in CUSAT academics with in the age limit 46 and above, and in University of Kerala academics with in the age limit 31 - 45 prefer both types of formats.

Table 4.3.15.2 Preference of the form of information source Vs Gender

		Gender	Among the following which form of source you would prefer			
			Electronic	Print	Both	Total
University	CUSAT	Male	47 (27.0%)	16 (9.2%)	111 (63.8%)	174 (100%)
		Female	24 (17.6%)	16 (11.8%)	96 (70.6%)	136 (100%)
		Total	71 (22.9%)	32 (10.3%)	207 (66.8%)	310 (100%)
	University of Kerala	Male	16 (16.7%)	14 (14.5%)	66 (68.8%)	96 (100%)
		Female	23 (14.6%)	24 (15.2%)	111 (70.2%)	158 (100%)
		Total	39 (15.3%)	38 (15.0%)	177 (69.7%)	254 (100%)

Table 4.3.15.2 provides gender wise opinion on the format of source preferred by the academics. Gender wise analysis shows that in both universities, female academics are more interested in both formats of source.

Table 4.3.15.3 Preference of the form of information source Vs Discipline

		Discipline	Among the following which form of source you would prefer			
			Electronic	Print	Both	Total
University	CUSAT	Science	49 (25.8%)	18 (9.5%)	123 (64.7%)	190 (100%)
		Technology	22 (18.3%)	14 (11.7%)	84 (70.0%)	120 (100%)
		Total	71 (22.9%)	32 (10.3%)	207 (66.8%)	310 (100%)
	University of Kerala	Science	25 (13.2%)	23 (12.1%)	142 (74.7%)	190 (100%)
		Technology	14 (21.9%)	15 (23.4%)	35 (54.7%)	64 (100%)
		Total	39 (15.3%)	38 (15.0%)	177 (69.7%)	254 (100%)

Discipline wise analysis shows that more number of technology academics in CUSAT and science academics in University of Kerala prefer both formats of source.

4.3.15.4 Preference of the form of information source Vs Category

Table 4.3.15.4.1 Preference of the form of information source Vs Teachers

		Category - Teachers	Among the following which form of source you would prefer			
			Electronic	Print	Both	Total
University	CUSAT	Lecturer	13 (18.6%)	12 (17.1%)	45 (64.3%)	70 (100%)
		Reader	6 (20.7%)	5 (17.2%)	18 (62.1%)	29 (100%)
		Professor	4 (19.0%)	3 (14.3%)	14 (66.7%)	21 (100%)
		Total	23 (19.2%)	20 (16.7%)	77 (64.2%)	120 (100%)
	University of Kerala	Lecturer	6 (15.4%)	11 (28.2%)	22 (56.4%)	39 (100%)
		Reader	2 (18.2%)	4 (36.4%)	5 (45.5%)	11 (100%)
		Professor	2 (40.0%)	0 (0.0%)	3 (60.0%)	5 (100%)
		Total	10 (18.2%)	15 (27.3%)	30 (54.5%)	55 (100%)

Teachers' category wise analysis reveals that Professors of both the universities are more inclined towards both formats of source; age wise analysis also confirms this.

Table 4.3.15.4.2 Preference of the form of information source Vs Research scholars

		Category - Researchers	Among the following which form of source you would prefer			
			Electronic	Print	Both	Total
University	CU SAT	Ph.D	42 (25.3%)	9 (5.4%)	115 (69.3%)	166 (100%)
		M.Phil	6 (25.0%)	3 (12.5%)	15 (62.5%)	24 (100%)
		Total	48 (25.3%)	12 (6.3%)	130 (68.4%)	190 (100%)
	University of Kerala	Ph.D	20 (16.4%)	8 (6.6%)	94 (77.0%)	122 (100%)
		M.Phil	9 (11.7%)	15 (19.5%)	53 (68.8%)	77 (100%)
		Total	29 (14.6%)	23 (11.6%)	147 (73.9%)	199 (100%)

Above table reveals that Ph.D scholars of both the universities are more inclined towards both formats of source.

Table 4.3.15 Relationship of dependent variable with academics characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	381.081	4.725	2	.094
Age group	379.659	3.303	4	.508
Gender	381.207	4.851	2	.088
Qualification(s)	389.095	12.739	8	.121
Category	396.717	20.361	8	.009
Discipline	376.866	.510	2	.775

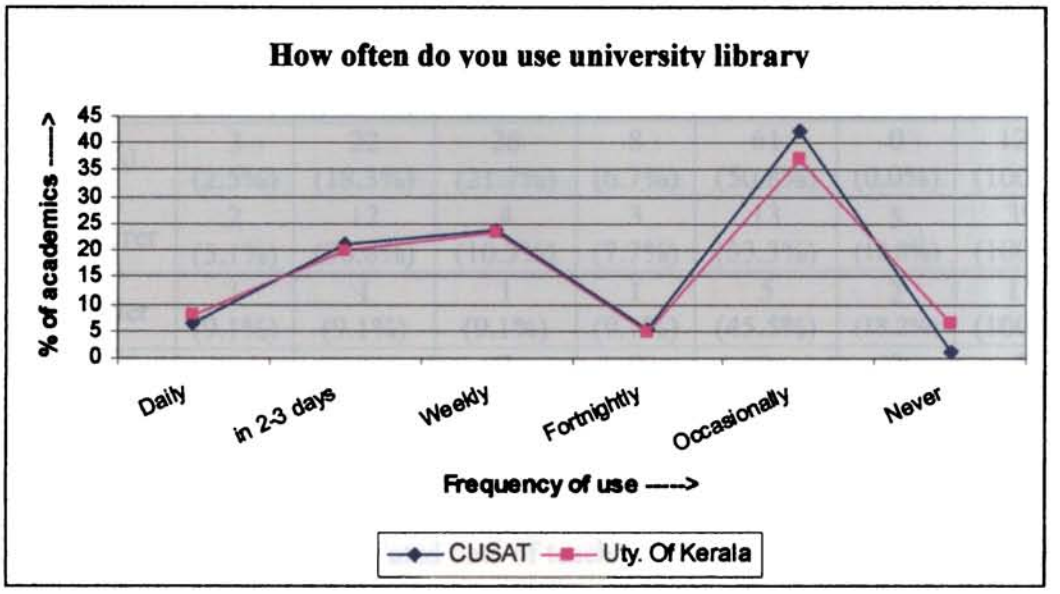
a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Nominal regression method was used to check whether there exists any relation between the form of source preferred by the academics and the user characteristics. Table 4.3.15 shows that category has a definite relation with the preference of form of information source.

4.4 Library use and services

ISB of an individual cannot be estimated with the help of a single question, hence various questions were framed taking into consideration the various facets of ISB and is broadly categorized under library use and services also.

4.4.1.A Frequency of use of university library



Graph 4.4.1A Frequency of use of university library – a comparison

Graph 4.4.1.A demonstrates a comparative analysis of academics use of university library. From graph it is evident that the university library is used in almost a similar pattern in both the universities, and also the respondents prefer to consult university library occasionally only. The availability of electronic resources, which can be accessed from anywhere in the campus and well-built department library system accounts for the marginal use of the university library.

4.4.1. A.1 Frequency of use of university library Vs Category

Table 4.4.1.A.1.1 Use of university library by teachers

University		Category	How often do you use university library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	CUSAT	Lecturer	1 (1.4%)	13 (18.6%)	17 (24.3%)	4 (5.7%)	35 (50.0%)	0 (0.0%)	70 (100%)
		Reader	1 (3.5%)	3 (10.3%)	7 (24.1%)	2 (6.9%)	16 (55.2%)	0 (0.0%)	29 (100%)
		Professor	1 (4.8%)	6 (28.6%)	2 (9.5%)	2 (9.5%)	10 (47.6%)	0 (0.0%)	21 (100%)
		Total	3 (2.5%)	22 (18.3%)	26 (21.7%)	8 (6.7%)	61 (50.8%)	0 (0.0%)	120 (100%)
	University of Kerala	Lecturer	2 (5.1%)	12 (30.8%)	4 (10.3%)	3 (7.7%)	13 (33.3%)	5 (12.8%)	39 (100%)
		Reader	1 (9.1%)	1 (9.1%)	1 (9.1%)	1 (9.1%)	5 (45.5%)	2 (18.2%)	11 (100%)
		Professor	1 (20.0%)	0 (0.0%)	2 (40.0%)	0 (0.0%)	2 (40.0%)	0 (0.0%)	5 (100%)
		Total	4 (7.3%)	13 (23.6%)	7 (12.7%)	4 (7.3%)	20 (36.4%)	7 (12.7%)	55 (100%)

Table 4.4.1.A1.1 provides a tabulated data of teachers' use of university library. Table shows that teachers use university library occasionally. As far as both the universities are concerned, most of them 46.3% use the library occasionally, and only 4% use the library daily. It is interesting to note that 12.7% of the teachers of University of Kerala never use university library.

Table 4.4.1.A.1.2 Use of university library by researchers

		Category-Researchers	How often do you use - University library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	CUSAT	Ph.D	11 (6.6%)	38 (22.9%)	42 (25.3%)	8 (4.8%)	64 (38.6%)	3 (1.8%)	166 (100%)
		M.Phil	6 (25.0%)	6 (25.0%)	6 (25.0%)	0 (0.0%)	6 (25.0%)	0 (0.0%)	24 (100%)
		Total	17 (8.9%)	44 (23.2%)	48 (25.3%)	8 (4.2%)	70 (36.8%)	3 (1.6%)	190 (100%)
	University of Kerala	Ph.D	6 (4.9%)	26 (21.3%)	31 (25.4%)	6 (4.9%)	47 (38.5%)	6 (4.9%)	122 (100%)
		M.Phil	10 (13.0%)	12 (15.6%)	22 (28.6%)	3 (3.9%)	27 (35.0%)	3 (3.9%)	77 (100%)
		Total	16 (8.0%)	38 (19.1%)	53 (26.6%)	9 (4.5%)	74 (37.2%)	9 (4.5%)	199 (100%)

Table 4.4.1.A.1.2 shows how the research scholars use the university library. In CUSAT, 8.9% of respondents use library daily, and 23.2% of respondents use library in 2 to three days, 25.3% weekly; 4.2% fortnightly; 38.5% occasionally and 1.6% never, while in University of Kerala it is 8%, 19.1%, 26.6%, 4.5%, 37.2% and 4.5%. From the table it is clear that most of the Ph.D scholars use university library occasionally only, and the number of non users of the library is also high among Ph.D scholars.

4.4.1.A.2 Discipline wise university library use by respondents

Table 4.4.1.A.2 Discipline wise use of university library by respondents

		Discipline	How often do you use university library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	CUSAT	Science	11 (5.79%)	38 (20.0%)	47 (24.7%)	11 (5.79%)	80 (42.1%)	3 (1.58%)	190 (100%)
		Technology	9 (7.5%)	28 (23.3%)	27 (22.5%)	5 (4.17%)	51 (42.5%)	0 (0%)	120 (100%)
		Total	20 (6.4%)	66 (21.3%)	74 (23.9%)	16 (5.2%)	131 (42.3%)	3 (0.97%)	310 (100%)
	University of Kerala	Science	14 (7.37%)	36 (18.9%)	45 (23.7%)	11 (5.79%)	73 (38.4%)	11 (5.79%)	190 (100%)
		Technology	6 (9.38%)	15 (23.4%)	15 (23.4%)	2 (3.13%)	21 (32.8%)	5 (7.81%)	64 (100%)
		Total	20 (7.9%)	51 (20.1%)	60 (23.6%)	13 (5.1%)	94 (37.0%)	16 (6.3%)	254 (100%)

Table 4.4.1.A.2 shows discipline wise use of university library in both universities. From table it is clear that academics use university library occasionally only. In both universities, there is not much difference in the discipline wise use of library.

Table 4.4.1.A.3 Age group wise use of university library by respondents

		Age group (Years)	How often do you use university library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	CUSAT	Below 30	18 (9.84%)	42 (22.9%)	47 (25.7%)	7 (3.83%)	66 (36.1%)	3 (1.64%)	183 (100%)
		31 - 45	1 (1.22%)	16 (19.5%)	20 (24.4%)	6 (7.32%)	39 (47.6%)	0 (0.0%)	82 (100%)
		above 46	1 (2.22%)	8 (17.8%)	7 (15.6%)	3 (6.67%)	26 (57.8%)	0 (0.0%)	45 (100%)
		Total	20 (6.45%)	66 (21.3%)	74 (23.9%)	16 (5.16%)	131 (42.3%)	3 (0.97%)	310 (100%)
	University of Kerala	Below 30	19 (9.5%)	41 (20.5%)	51 (25.5%)	10 (5.0%)	68 (34.0%)	11 (5.5%)	200 (100%)
		31 - 45	0 (0.0%)	10 (26.3%)	7 (18.4%)	2 (5.26%)	16 (42.1%)	3 (7.89%)	38 (100%)
		above 46	1 (6.25%)	0 (0%)	2 (12.5%)	1 (6.25%)	10 (62.5%)	2 (12.5%)	16 (100%)
		Total	20 (7.9%)	51 (20.1%)	60 (23.6%)	13 (5.1%)	94 (37.0%)	16 (6.3%)	254 (100%)

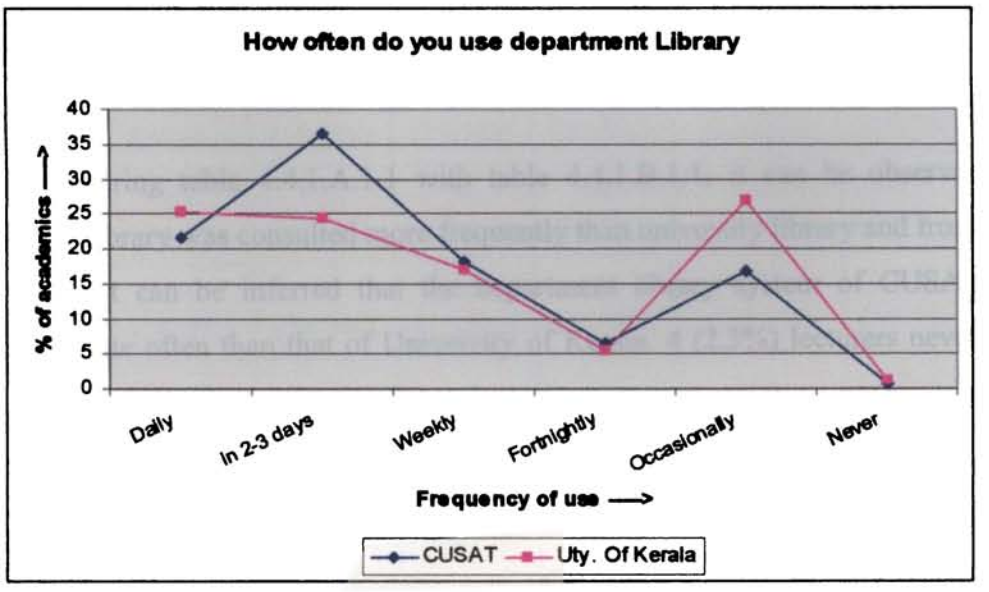
From graph it is clear that academics of all age groups are using university library occasionally only. Academics of age group 46 and above are using library very occasionally only. Some academics of all age groups never used their university library. In both universities percentage of non use of the library was mostly attributed by academics within the age limit of below 30 years.

Table 4.4.1.A Relationship of the use of university library with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	685.560	12.892	5	.024
Age group	695.267	22.599	10	.012
Gender	683.384	10.716	5	.057
Qualification	692.578	19.910	20	.464
Category	693.667	20.999	20	.397
Discipline	677.273	4.605	5	.466

The frequency of the use of university library by the academics was statistically tested using nominal regression for its significance with various user characteristics and is presented in table 4.4.1A. Table 4.4.1A statistically proves that institution, age group and to some extend gender have an effect on academicians university library usage.

4.4.1.B Frequency of use of department library



Graph 4.4.1.B Frequency of use of department library – a comparison

Academics department library usage was examined and pictorially presented in the graph 4.4.1.B. Above graph shows that most of the respondents (36.5%) of CUSAT prefer to use the department library in 2-3 days, while in University of Kerala most of the respondents prefer to use it either daily or in 2-3 days. From graph it is evident that department library system is used significantly than university library. The proximity of library accounts for this.

4.4.1.B.1 How often do you use department library Vs Category

Table 4.4.1.B.1.1 Teachers category wise use of department library

		Category	How often do you use department library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	CUSAT	Lecturer	8 (11.4%)	30 (42.9%)	11 (15.7%)	8 (11.4%)	12 (17.1%)	1 (1.4%)	70 (100%)
		Reader	6 (20.7%)	11 (37.9%)	5 (17.2%)	2 (6.9%)	5 (17.2%)	0 (0%)	29 (100%)
		Professor	7 (33.3%)	6 (28.6%)	2 (9.5%)	3 (14.3%)	3 (14.3%)	0 (0%)	21 (100%)
		Total	21 (17.5%)	47 (39.2%)	18 (15.0%)	13 (10.8%)	20 (16.7%)	1 (0.8%)	120 (100%)
	University of Kerala	Lecturer	6 (15.4%)	12 (30.8%)	5 (12.8%)	3 (7.7%)	10 (25.6%)	3 (7.7%)	39 (100%)
		Reader	1 (9.1%)	3 (27.3%)	4 (36.3%)	1 (9.1%)	2 (18.2%)	0 (0.0%)	11 (100%)
		Professor	1 (20.0%)	1 (20.0%)	0 (0.0%)	1 (20.0%)	2 (40.0%)	0 (0.0%)	5 (100%)
		Total	8 (14.5%)	16 (29.1%)	9 (16.4%)	5 (9.1%)	14 (25.5%)	3 (5.5%)	55 (100%)

When comparing table 4.4.1.A.1.1 with table 4.4.1.B.1.1, it can be observed that department library was consulted more frequently than university library and from table 4.4.1.B.1.1, it can be inferred that the department library system of CUSAT was consulted quite often than that of University of Kerala. 4 (2.3%) lecturers never used department library.

Table 4.4.1.B.1.2 Research scholar wise use of department library

		Category	How often do you use - department library						Total
			Daily	**in 2-3 days**	**Weekly**	**Fortnightly**	**Occasionally**	**Never**	
University	CUSAT	Ph.D	31 (18.7%)	63 (38.0%)	36 (21.7%)	6 (3.6%)	29 (17.5%)	1 (0.6%)	166 (100%)
		M.Phil	15 (62.5%)	3 (12.5%)	2 (8.3%)	1 (4.2%)	3 (12.5%)	0 (0.0%)	24 (100%)
		Total	46 (8.9%)	66 (23.2%)	38 (25.3%)	7 (4.2%)	32 (36.8%)	1 (1.6%)	190 (100%)
	University of Kerala	Ph.D	31 (25.4%)	30 (24.6%)	15 (12.3%)	8 (6.6%)	38 (31.1%)	0 (0.0%)	122 (100%)
		M.Phil	25 (32.5%)	16 (20.8%)	19 (24.7%)	1 (1.3%)	16 (20.8%)	0 (0.0%)	77 (100%)
		Total	56 (28.1%)	46 (23.1%)	34 (17.1%)	9 (4.5%)	54 (27.1%)	0 (0.0%)	199 (100%)

From the above table it can be seen that department library is most commonly used by researchers when compared with university libraries. From table it is obvious that M.Phil scholars use department library more. This is true with both the universities.

Table 4.4.1.B.2 Discipline wise use of library by respondents- Department library

		Discipline	How often do you use department library						Total
			Daily	**in 2-3 days**	**Weekly**	**Fortnightly**	**Occasionally**	**Never**	
University	CUSAT	Science	43 (22.6%)	66 (34.7%)	33 (17.4%)	13 (6.84%)	34 (17.9%)	1 (0.53%)	190 (100%)
		Technology	24 (20.0%)	47 (39.2%)	23 (19.2%)	7 (5.83%)	18 (15.0%)	1 (0.83%)	120 (100%)
		Total	67 (21.6%)	113 (36.5%)	56 (18.1%)	20 (6.5%)	52 (16.8%)	2 (0.6%)	310 (100%)
	University of Kerala	Science	51 (26.8%)	46 (24.2%)	25 (13.2%)	11 (5.79%)	56 (29.5%)	1 (0.53%)	190 (100%)
		Technology	13 (20.3%)	16 (25.0%)	18 (28.1%)	3 (4.69%)	12 (18.8%)	2 (3.13%)	64 (100%)
		Total	64 (25.2%)	62 (24.4%)	43 (16.9%)	14 (5.5%)	68 (26.8%)	3 (1.2%)	254 (100%)

Discipline wise use of department library by the respondents is studied and is presented in table 4.4.1.B.2. Table shows a similar pattern use of department library, and from table it is evident that department library of CUSAT is consulted quite often than that of University of Kerala.

Table 4.4.1.B.3 Age group wise use of library by respondents- Department library

		Age group (Years)	How often do you use department library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	CUSAT	Below 30	43 (23.5%)	65 (35.5%)	37 (20.2%)	6 (3.3%)	30 (16.4%)	2 (1.1%)	183 (100%)
		31 - 45	16 (19.5%)	30 (36.6%)	13 (15.9%)	7 (8.5%)	16 (19.5%)	0 (0.0%)	82 (100%)
		above 46	8 (17.8%)	18 (40.0%)	6 (13.3%)	7 (15.6%)	6 (13.3%)	0 (0.0%)	45 (100%)
		Total	67 (21.6%)	113 (36.5%)	56 (18.1%)	20 (6.5%)	52 (16.8%)	2 (0.6%)	310 (100%)
	University of Kerala	Below 30	52 (26.0%)	51 (25.5%)	36 (18.0%)	9 (4.5%)	50 (25.0%)	2 (1%)	200 (100%)
		31 - 45	9 (23.7%)	8 (21.0%)	4 (10.5%)	4 (10.5%)	12 (31.6%)	1 (2.63%)	38 (100%)
		above 46	3 (18.8%)	3 (18.8%)	3 (18.8%)	1 (6.25%)	6 (37.5%)	0 (0.0%)	16 (100%)
		Total	64 (25.2%)	62 (24.4%)	43 (16.9%)	14 (5.5%)	68 (26.8%)	3 (1.2%)	254 (100%)

Academics age wise department library usage was studied and is illustrated in the table 4.4.1.B.3. A good number of academics are using the department library either daily or in 2-3 days. Age wise analysis shows that in CUSAT academics of all age groups are using the library in almost similar way, but in University of Kerala, academics with in the age limit 46 and above are using the library occasionally only. Even though the percentage of the academics who had never consulted the library is negligible, mostly young academics account for this.

Table 4.4.1.B Relationship of the use of department library with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	1.214E3	81.522	5	.000
Age group	1.213E3	80.598	10	.000
Gender	1.177E3	44.686	5	.000
Qualification	758.889		20	
Category	767.187		20	
Discipline	1.119E3	.	5	.

a. This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom

b. The log-likelihood value cannot be further increased after maximum number of step-halving.

The frequency of academics use of department library was statistically verified using nominal regression for its significance with various user characteristics and is presented in table 4.4.1.B. Table shows that institution, age group, gender, qualification, category and discipline have an effect on academics use of department library.

4.4.1.C Use of campus library by respondents

Table 4.4.1.C Use of campus library by respondents

		How often do you use campus library						
		Daily	**in 2-3 days**	**Weekly**	**Fortnightly**	**Occasionally**	**Never**	**Total**
University	University of Kerala	117 (52.0%)	59 (26.2%)	17 (7.6%)	1 (0.4%)	5 (2.2%)	26 (11.6%)	225 (100%)
Total		117 (52.0%)	59 (26.2%)	17 (7.6%)	1 (0.4%)	5 (2.2%)	26 (11.6%)	225 (100%)

Table 4.4.1.C presents the campus library usage in University of Kerala. Table shows that majority (52.0%) of the academics use campus library daily. The location of the library is vital and in contrast to university library and department library usage, the number of academics who had never consulted the library is high.

4.4.1.C.1 Category wise campus library use by respondents

Table 4.4.1.C.1.1 Category wise use of campus library by teachers

		Category	How often do you use campus library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	University of Kerala	Lecturer	19 (48.7%)	11 (28.2%)	4 (10.3%)	1 (2.6%)	0 (0.0%)	4 (10.3%)	39 (100%)
		Reader	5 (45.5%)	1 (9.1%)	1 (9.1%)	1 (9.1%)	1 (9.1%)	2 (18.2%)	11 (100%)
		Professor	0 (0.0%)	1 (20.0%)	1 (20.0%)	1 (20.0%)	1 (20.0%)	1 (20.0%)	5 (100%)
		Total	24 (43.6%)	13 (23.6%)	6 (10.9%)	3 (5.5%)	2 (3.6%)	7 (12.7%)	55 (100%)

Above table shows that most of the teachers use campus library regularly, and among various parameters of campus library usage, most of the academics use campus library daily.

Table 4.4.1.C.1.2 Category wise use of campus library by researchers

		Category	How often do you use - campus library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	University of Kerala	Ph.D	43 (43.4%)	30 (30.3%)	8 (8.1%)	1 (1.0%)	2 (2.0%)	15 (15.2%)	99 (100%)
		M.Phil	50 (67.6%)	16 (21.6%)	3 (4.1%)	0 (0.0%)	1 (1.4%)	4 (5.4%)	74 (100%)
		Total	93 (53.8%)	46 (26.6%)	11 (6.4%)	1 (0.6%)	3 (1.7%)	19 (11.0%)	173 (100%)

Table 4.4.1.C.1.2 presents category wise use of campus library by research scholars. As in the case of teachers, majority of the researchers (53.8%) use campus library daily.

Table 4.4.1.C.2 Discipline wise use of campus library by respondents

		Discipline	How often do you use campus library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	University of Kerala	Science	85 (52.8%)	41 (25.5%)	13 (8.1%)	1 (0.6%)	3 (1.9%)	18 (11.2%)	161 (100%)
		Technology	32 (50.0%)	18 (28.1%)	4 (6.3%)	0 (0%)	2 (3.1%)	8 (12.5%)	64 (100%)
		Total	117 (52.0%)	59 (26.2%)	17 (7.6%)	1 (0.4%)	5 (2.2%)	26 (11.6%)	225 (100%)

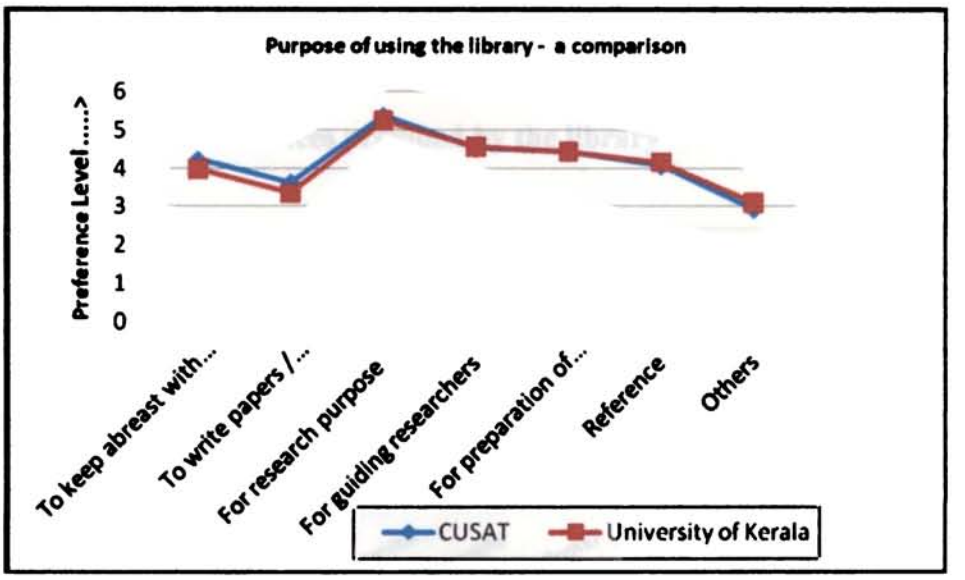
Table 4.4.1.C.2 shows discipline wise use of campus library in University of Kerala. Discipline wise analysis shows that science academics (52.8%) use campus library more than technology academics (50.0%).

Table 4.4.1.C.3 Age group wise use of campus library by respondents

		Age group (Years)	How often do you use campus library						Total
			Daily	in 2-3 days	Weekly	Fortnightly	Occasionally	Never	
University	University of Kerala	Below 30	99 (56.3%)	42 (23.9%)	13 (7.4%)	1 (0.6%)	3 (1.7%)	18 (10.2%)	176 (100%)
		31 - 45	13 (37.1%)	14 (40.0%)	2 (5.7%)	0 (0.0%)	1 (2.9%)	5 (14.3%)	35 (100%)
		above 46	5 (35.7%)	3 (21.4%)	2 (14.3%)	0 (0.0%)	1 (7.14%)	3 (21.4%)	14 (100%)
		Total	117 (52.0%)	59 (26.2%)	17 (7.6%)	1 (0.4%)	5 (2.2%)	26 (11.6%)	225 (100%)

Campus library usage by academics of different age groups is tabulated in the table 4.4.1.C.3. From table it is evident that the campus library is consulted very frequently by the academics, and age wise analysis reveals that academics within age limit of below 30 years are using the library more frequently.

4.4.2 Purpose of using the library



Graph 4.4.2 Purpose of using the library

Graph 4.4.2 provides a comparative picture of academics purpose of using the library. Graph shows a similar pattern of purpose among academics of both the universities, and for research most of the academics use the library followed by guiding researchers, which implies that the academics use the library for fulfilling their academic needs. Several studies Bavakutty (Bavakutty, 1998), Ocholla (Ocholla, 1999), Shanmugan (Shanmugan, 1999), Ileperuma (Ileperuma, 2002), Patitungkho (Patitungkho, et al., 2005), Naushad Ali (Naushad Ali, et al., 2006), Sheela (Sheela, 2006) also reported similar findings.

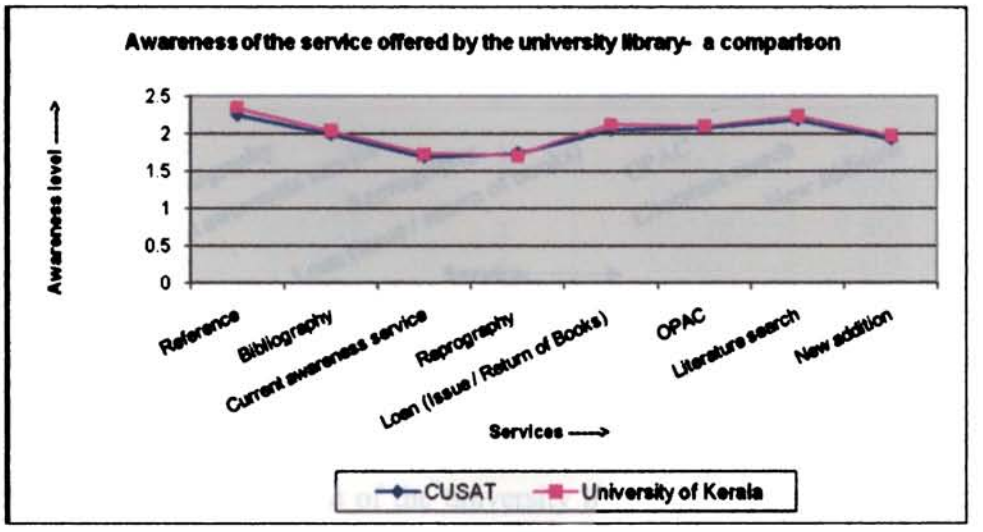
Table 4.4.2 Relationship of the purpose of using the library with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	618.316	1.209	5	.944
Age group	633.477	16.371	10	.089
Gender	618.978	1.872	5	.867
Qualification(s)	632.696	15.590	20	.742
Category	630.547	13.440	20	.858
Discipline	619.266	2.160	5	.827

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Nominal regression was used to check whether there exists any relation between the dependent variable and the user characteristics. From table it is clear that there exists no relation between the dependent variable and the user characteristics.

4.4.3 Awareness of the services provided by the library

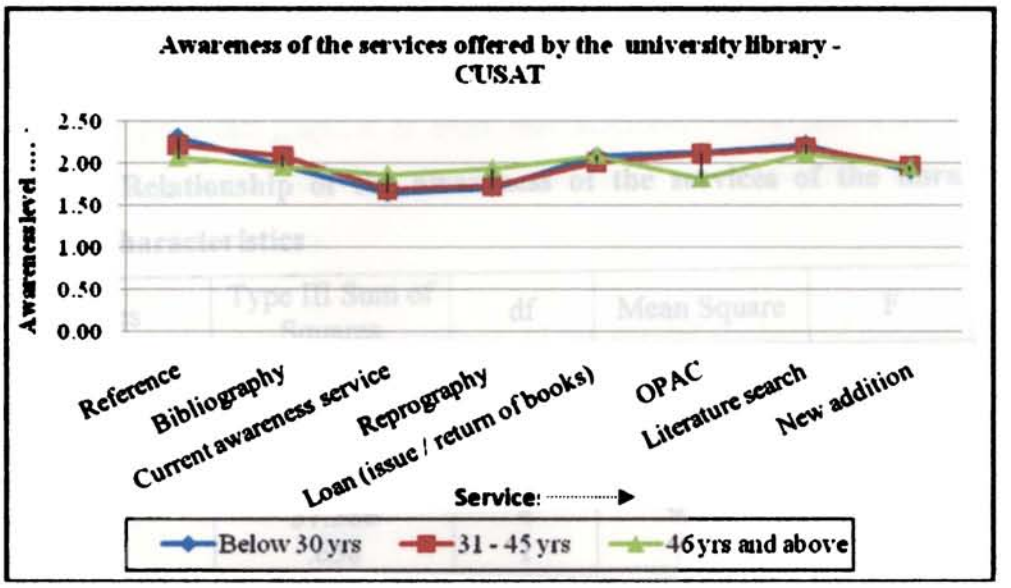


Graph 4.4.3 Awareness of the services provided by the library

Graph provides a comparative sketch of the awareness level of academics about the services offered by the university library. Awareness pattern of the academics of both the universities shows resemblance. Here the bench-mark awareness level is 1.5. From graph it is evident that academics are aware of all the services offered by the library. Among the services, they are aware of reference service more followed by literature search, OPAC and loan.

4.4.3.1 Awareness of the services provided by the library Vs Age

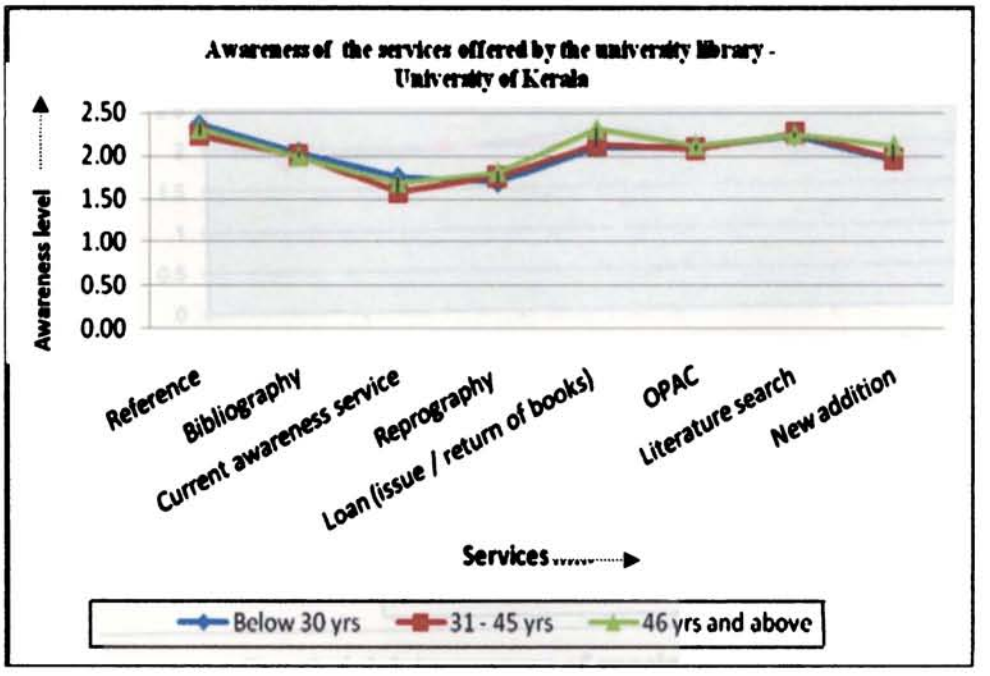
4.4.3.1.1 Awareness of the services provided by the library Vs Age – CUSAT



Graph 4.4.3.1.1 Awareness of the services provided by the library Vs Age - CUSAT

Awareness level of the services of the university library is examined age wise and is presented in the graph 4.4.3.1.1. Graph shows that academics of all age groups are aware of the services of the library.

4.4.3.1.2 Awareness of the services provided by the library Vs Age – University of Kerala



Graph 4.4.3.1.2 Awareness of the services provided by the library Vs Age – University of Kerala

Graph 4.4.3.1.2 reveals that reference service is the most well-informed service of the library, and academics with in the age group of below 30 years are more aware about this service. From graph it is clear that academics of all age groups are aware of the services of the library.

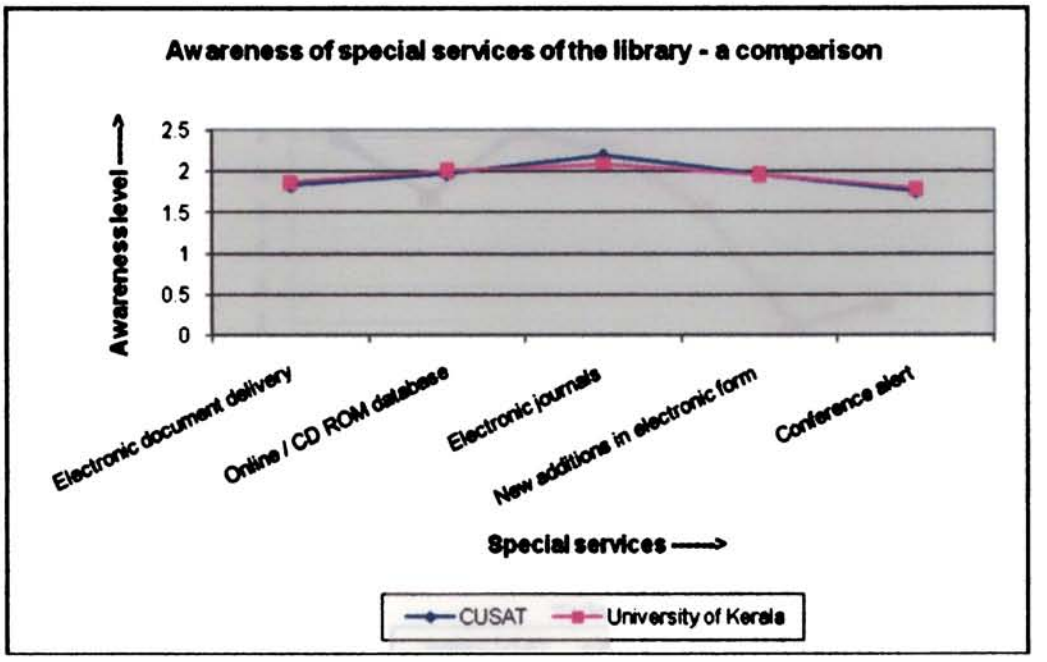
Table 4.4.3 Relationship of the awareness of the services of the library with academics' characteristics

Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
University	27.229	1	27.229	2.043	.153
Age group	2.070	2	1.035	.078	.925
Gender	105.120	1	105.120	7.888	.005
Qualification(s)	22.346	4	5.586	.419	.795
Category	37.388	4	9.347	.701	.591
Discipline	.638	1	.638	.048	.827

a R Squared = .031 (Adjusted R Squared = .008)

ANOVA was used to check any relation between the awareness of the services of the library and the respondent's characteristics and is presented below. Table 4.4.3 shows a relation between gender and the dependent variable.

4.4.4 Awareness of special services



Graph 4.4.4 Awareness of special services

Graph 4.4.4 presents a comparative study of the academics awareness of the special services of the library. Here also graph shows similar pattern of awareness level among academics of both universities. The bench mark awareness level is 1.5. The services which have got awareness level of 1.5 and above imply that academics are aware of the services, and from the graph it is clear that academics have idea about all these services. Among various services, the academics are most aware of the electronic journals service of the library.

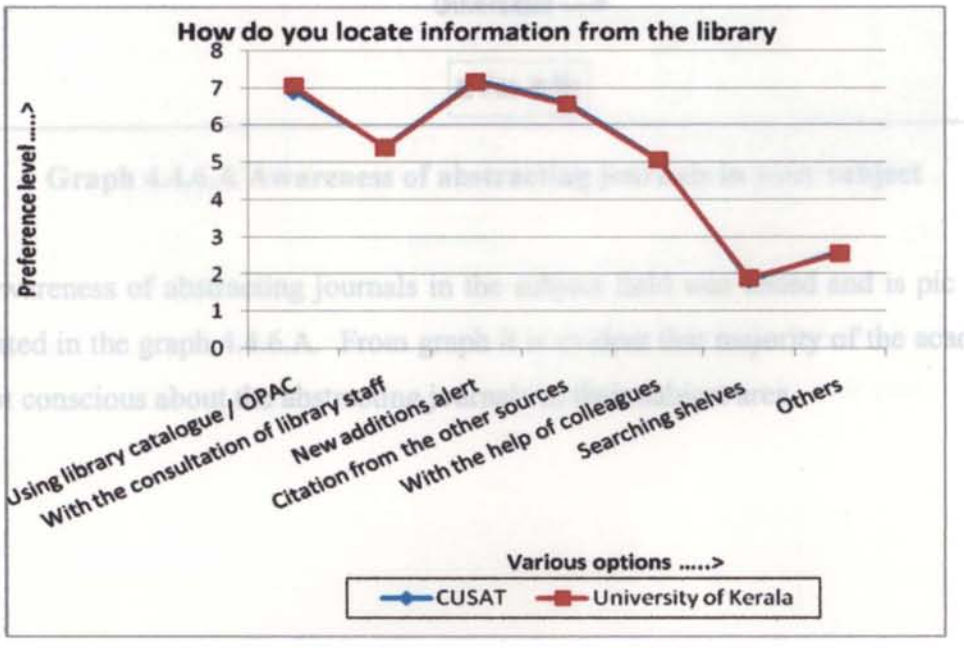
Table 4.4.4 Relationship of the awareness of the special services of the library with academics characteristics

Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
University	.300	1	.300	2.051	.153
Age group	.448	2	.224	1.529	.218
Gender	.055	1	.055	.373	.541
Qualification(s)	.387	4	.097	.661	.620
Category	1.980	4	.495	3.381	.010
Discipline	.015	1	.015	.105	.746

a R Squared = .042 (Adjusted R Squared = .020)

Relationship between the dependent variable and the respondents characteristics was verified using ANOVA and is presented here. From table 4.4.4 it is evident that category has an impact on the dependent variable.

4.4.5 How do you locate information from the library

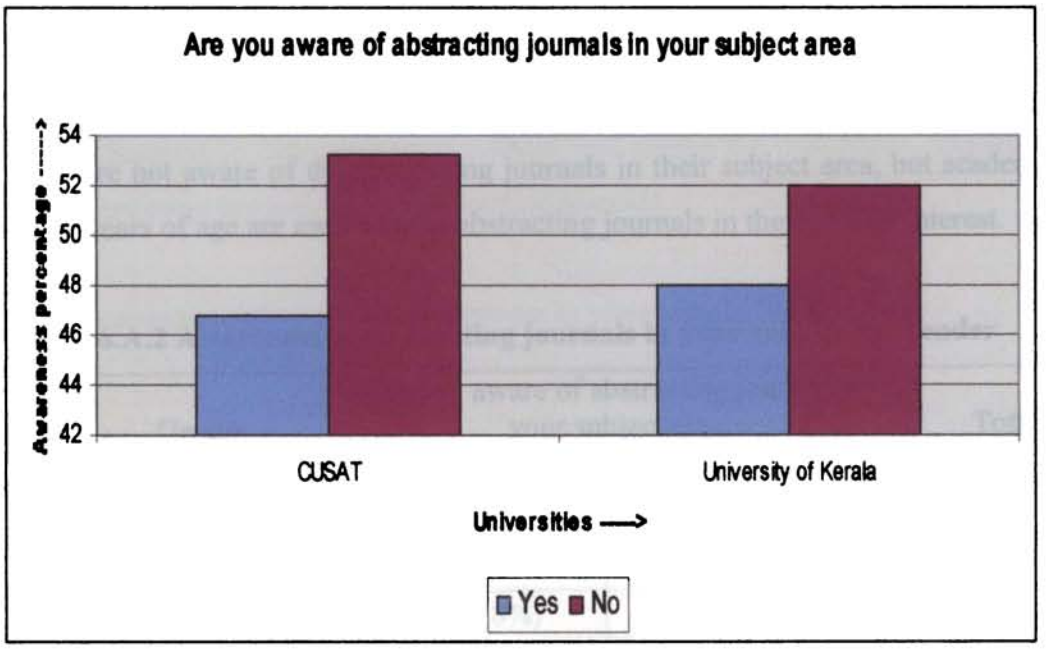


Graph 4.4.5 How do you locate information from the library

Graph 4.4.5 shows comparative analysis of how the academics locate information from the library. Here also a similar pattern of information location among the academics of the universities is evident. The bench mark is 4.5 and the options which have got a value of 4.5 and above are the preferred means for locating information from the library. From the above graph it is apparent that new addition alert is the chief source for locating information from the library in both the universities followed by library catalogue.

4.4.6 Awareness of abstracting journals in your subject

4.4.6.A Awareness of abstracting journals in your subject



Graph 4.4.6.A Awareness of abstracting journals in your subject

The awareness of abstracting journals in the subject field was tested and is pictorially presented in the graph 4.4.6.A. From graph it is evident that majority of the academics are not conscious about the abstracting journals in their subject area.

Table 4.4.6.A.1 Awareness of abstracting journals in your subject Vs Age

		Age Group (Years)	Are you aware of abstracting journals in your subject area		Total
			Yes	No	
University	CUSAT	Below 30	81 (44.3%)	102 (55.7%)	183 (100%)
		31- 45	41 (50.0%)	41 (50.0%)	82 (100%)
		46 and above	23 (51.1%)	22 (48.9%)	45 (100%)
		Total	145(46.8%)	165 (53.2%)	310 (100%)
	University of Kerala	Below 30	95 (47.5%)	105 (52.5%)	200 (100%)
		31- 45	18 (47.4%)	20 (52.6%)	38 (100%)
		46 and above	9 (56.3%)	7 (43.8%)	16 (100%)
		Total	122 (48.0%)	132 (52.0%)	254 (100%)

Age wise analysis shows that majority of the academics with in the age limit of below 30 years are not aware of the abstracting journals in their subject area, but academics above 46 years of age are aware of the abstracting journals in their area of interest.

Table 4.4.6.A.2 Awareness of abstracting journals in your subject Vs Gender

		Gender	Are you aware of abstracting journals in your subject area		Total
			Yes	No	
University	CUSAT	Male	77 (44.3%)	97 (55.7%)	174 (100%)
		Female	68 (50.0%)	68 (50.0%)	136 (100%)
		Total	145 (46.8%)	165 (53.2%)	310 (100%)
	University of Kerala	Male	53 (55.2%)	43 (44.8%)	96 (100%)
		Female	69 (43.7%)	89 (56.3%)	158 (100%)
		Total	122 (48.0%)	132 (52.0%)	254 (100%)

Gender wise analysis reveals that in CUSAT, female academics and in University of Kerala male academics are more aware of the abstracting journals in their area of study.

Table 4.4.6.A.3 Awareness of abstracting journals in your subject Vs Discipline

		Discipline	Are you aware of abstracting journals in your subject area		Total
			Yes	No	
University	CUSAT	Science	91 (47.9%)	99 (52.1%)	190 (100%)
		Technology	54 (45.0%)	66 (55.0%)	120 (100%)
		Total	145 (46.8%)	165 (53.2%)	310 (100%)
	University of Kerala	Science	93 (48.9%)	97 (51.1%)	190 (100%)
		Technology	29 (45.3%)	35 (54.7%)	64 (100%)
		Total	122 (48.0%)	132 (52.0%)	254 (100%)

Above table reveals that academics of both the disciplines are not aware of the abstracting journals in their concerned subject, and among the disciplines, technology academics are more unaware of the abstracting journals.

4.4.6.A.4 Awareness of abstracting journals in your subject Vs Category

Table 4.4.6.A.4.1 Awareness of abstracting journals in your subject Vs Teachers

		Category-Teachers	Are you aware of abstracting journals in your subject area		Total
			Yes	No	
University	CUSAT	Lecturer	32 (45.7%)	38 (54.3%)	70 (100%)
		Reader	12 (41.4%)	17 (58.6%)	29 (100%)
		Professor	15 (71.4%)	6 (28.6%)	21 (100%)
		Total	59 (49.2%)	61 (50.8%)	120 (100%)
	University of Kerala	Lecturer	19 (48.7%)	20 (51.3%)	39 (100%)
		Reader	4 (36.4%)	7 (63.6%)	11 (100%)
		Professor	2 (40.0%)	3 (60.0%)	5 (100%)
		Total	25 (45.5%)	30 (54.5%)	55 (100%)

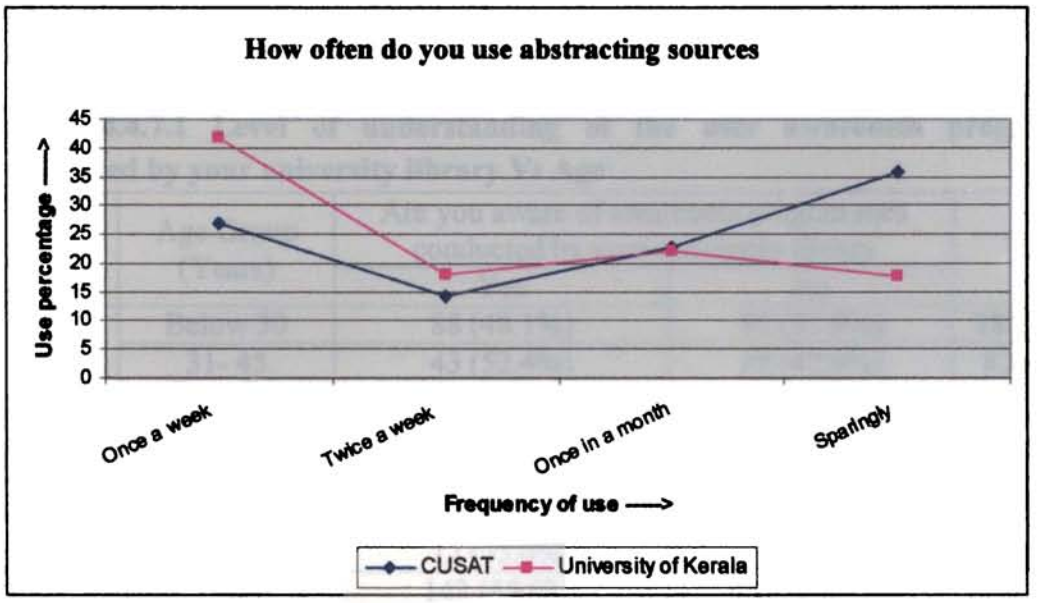
Table 4.4.6.A.4.1 shows that majority of the teachers of all categories except Professors of CUSAT are unacquainted with the abstracting journals in the subject of interest.

Table 4.4.6.A.4.2 Awareness of abstracting journals in your subject Vs Research scholars

		Category-Researchers	Are you aware of abstracting journals in your subject area		Total
			Yes	No	
University	CUSAT	Ph.D	77 (46.4%)	89 (53.6%)	166 (100%)
		M.Phil	9 (37.5%)	15 (62.5%)	24 (100%)
		Total	86 (45.3%)	104 (54.7%)	190 (100%)
	University of Kerala	Ph.D	58 (47.5%)	64 (52.5%)	122 (100%)
		M.Phil	39 (50.6%)	38 (49.4%)	77 (100%)
		Total	97 (48.7%)	102 (51.3%)	199 (100%)

Research scholar wise awareness of abstracting journals is studied and is presented in the table 4.4.6.A.4.2. Table shows that research scholars of the universities except M.Phil scholars of University of Kerala are ignorant about the abstracting journals in their subject field.

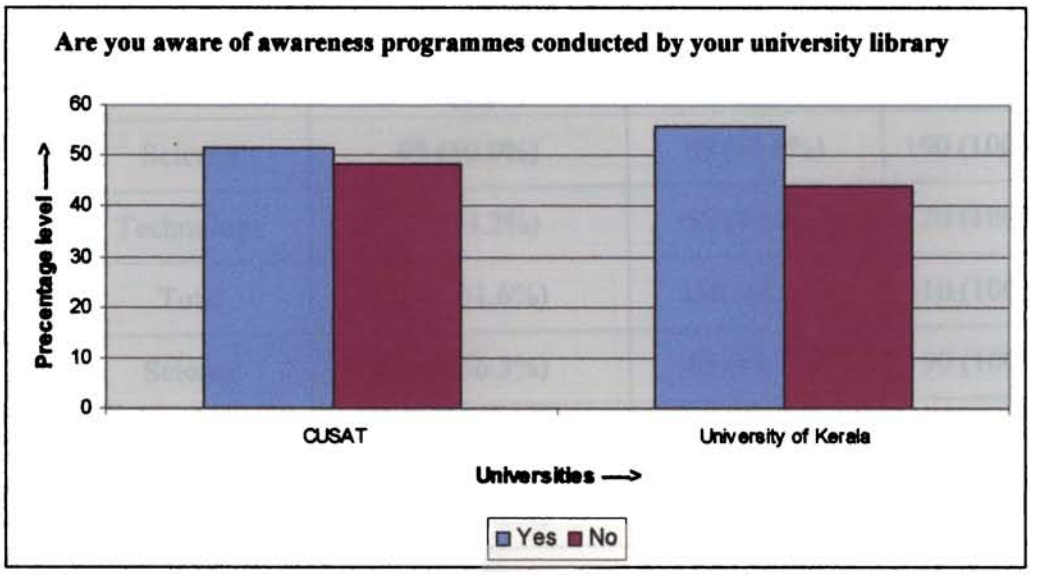
4.4.6.B Frequency of the use of abstracting sources



Graph 4.4.6.B Frequency of the use of abstracting sources

The academics are not much aware of the abstracting sources in their field of study, and this is reflected in the usage of the abstracting sources. Academics of CUSAT are using this source less when compared with the academics of University of Kerala.

4.4.7 Level of understanding of the user awareness programmes conducted by your university library



Graph 4.4.7 Level of understanding of the user awareness programmes conducted by your university library

Majority of the users are conscious about the user awareness programmes conducted by the respective university libraries, and academics of University of Kerala are more aware of such programmes.

Table 4.4.7.1 Level of understanding of the user awareness programmes conducted by your university library Vs Age

		Age Group (Years)	Are you aware of awareness programmes conducted by your university library		Total
			Yes	No	
University	CUSAT	Below 30	88 (48.1%)	95 (51.9%)	183 (100%)
		31- 45	43 (52.4%)	39 (47.6%)	82 (100%)
		46 and above	29 (64.4%)	16 (35.6%)	45 (100%)
		Total	160 (51.6%)	150 (48.4%)	310 (100%)
	University of Kerala	Below 30	112 (56.0%)	88 (44.0%)	200 (100%)
		31- 45	18 (47.4%)	20 (52.6%)	38 (100%)
		46 and above	12 (75.0%)	4 (25.0%)	16 (100%)
		Total	142 (55.9%)	112 (44.1%)	254 (100%)

Age wise analysis is presented in the table 4.4.7.1, and from table it is evident that academics within the age limit 46 and above, are more aware of the user awareness programmes conducted by the respective libraries.

Table 4.4.7.2 Level of understanding of the user awareness programmes conducted by your university library Vs Discipline

		Discipline	Are you aware of awareness programmes conducted by your university library		Total
			Yes	No	
University	CUSAT	Science	95 (50.0%)	95 (50.0%)	190 (100%)
		Technology	65 (54.2%)	55 (45.8%)	120 (100%)
		Total	160 (51.6%)	150 (48.4%)	310 (100%)
	University of Kerala	Science	107 (56.3%)	83 (43.7%)	190 (100%)
		Technology	35 (54.7%)	29 (45.3%)	64 (100%)
		Total	142 (55.9%)	112 (44.1%)	254 (100%)

Discipline wise analysis shows that in CUSAT, technology academics and in University of Kerala, science academics are more aware of the user awareness programmes conducted by the respective libraries.

Table 4.4.7.3 Level of understanding of the user awareness programmes conducted by your university library Vs Gender

		Gender	Are you aware of awareness programmes conducted by your university library		Total
			Yes	No	
University	CUSAT	Male	92 (52.9%)	82 (47.1%)	174 (100%)
		Female	68 (50.0%)	68 (50.0%)	136 (100%)
		Total	160 (51.6%)	150 (48.4%)	310 (100%)
	University of Kerala	Male	61 (63.5%)	35 (36.5%)	96 (100%)
		Female	81 (51.3%)	77 (48.7%)	158 (100%)
		Total	142 (55.9%)	112 (44.1%)	254 (100%)

Gender wise analysis shows that male academics of both the universities are more aware of the user awareness programmes conducted by the libraries.

4.4.7.4 Level of understanding of the user awareness programmes conducted by your university library Vs Category

Table 4.4.7.4.1 Level of understanding of the user awareness programmes conducted by your university library Vs Teachers

		Category-Teachers	Are you aware of awareness programmes conducted by your university library		Total
			Yes	No	
University	CUSAT	Lecturer	35 (50.0%)	35 (50.0%)	70 (100%)
		Reader	20 (69.0%)	9 (31.0%)	29 (100%)
		Professor	15 (71.4%)	6 (28.6%)	21 (100%)
		Total	70 (58.3%)	50 (41.7%)	120 (100%)
	University of Kerala	Lecturer	24 (61.5%)	15 (38.5%)	39 (100%)
		Reader	7 (63.6%)	4 (36.4%)	11 (100%)
		Professor	4 (80.0%)	1 (20.0%)	5 (100%)
		Total	35 (63.6%)	20 (36.4%)	55 (100%)

Teachers of both the universities are aware of the user awareness programmes conducted by the university library, and category wise analysis shows that professors are more aware of these kinds of programmes

Table 4.4.7.4.2 Level of understanding of the user awareness programmes conducted by your university library Vs Research scholars

		Category-Researchers	Are you aware of awareness programmes conducted by your university library		Total
			Yes	No	
University	CUSAT	Ph.D	81 (48.8%)	85 (51.2%)	166 (100%)
		M.Phil	9 (37.5%)	15 (62.5%)	24 (100%)
		Total	90 (47.4%)	100 (52.6%)	190 (100%)
	University of Kerala	Ph.D	59 (48.4%)	63 (51.6%)	122 (100%)
		M.Phil	48 (62.3%)	29 (37.7%)	77 (100%)
		Total	107 (53.8%)	92 (46.2%)	199 (100%)

Research scholar wise analysis shows that in CUSAT, majority of the research scholars are not aware of the user awareness programmes conducted by the university library

where as in University of Kerala majority of the users are aware of the user awareness programmes conducted by the university library.

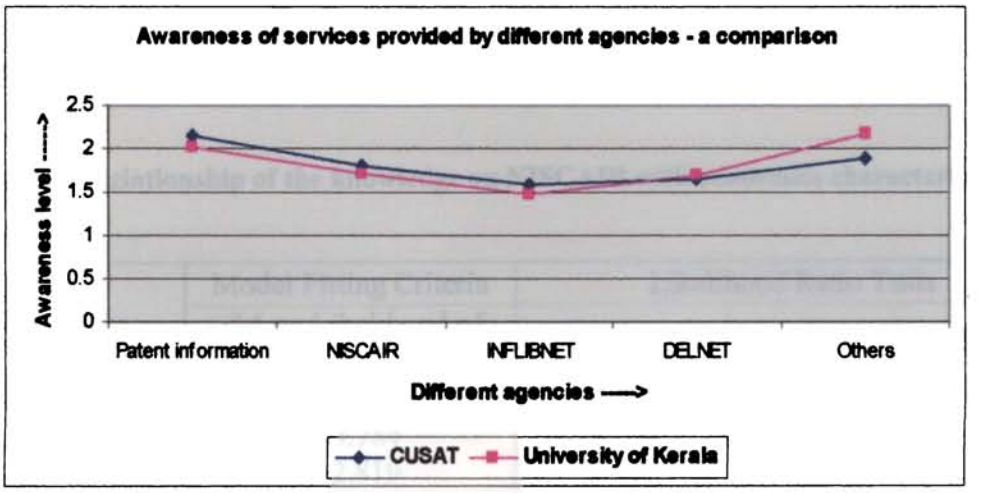
Table 4.4.7 Relationship of the dependent variable with academics characteristics

Logistic regression was used to test the significance of user awareness programmes conducted by the university library with the respondent's characteristics and is presented in the table 4.4.7.

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
University	-.327	.180	3.291	1	.070	.721
Age group	-.296	.154	3.692	1	.055	.744
Gender	.247	.178	1.909	1	.167	1.280
Qualification	.088	.043	4.207	1	.040	1.092
Category	-.056	.084	.451	1	.502	.945
Discipline	.111	.207	.287	1	.592	1.117

Table 4.4.7 established that qualification and age group is significant with the user awareness programmes conducted by the library.

4.4.8 Awareness of services offered by different agencies



Graph 4.4.8 Awareness of services offered by different agencies

Above graph presents a comparative analysis of the academics awareness of the services offered by different agencies. Agencies which have got a value of 1.5 or more are the agencies whose services are aware for the academicians. From graph it is apparent that academics are aware of the services offered by these agencies.

4.4.8.1 Patent information centre

Table 4.4.8.1 Relationship of the knowledge on patent information centre with academics characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	227.675	5.669	2	.059
Age group	233.884	11.878	4	.018
Gender	222.616	.610	2	.737
Qualification(s)	226.124	4.118	6	.661
Discipline	223.855	1.849	2	.397
Category	222.618	.612	2	.736

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The awareness of the services offered by the patent information centre was statistically verified in relation to various user characteristics using logistic regression and is presented in the table 4.4.8.1. From table it is evident that institution and age group have an effect on the awareness about the services of the patent information centre.

4.4.8.2 NISCAIR

Table 4.4.8.2 Relationship of the knowledge on NISCAIR with academics characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	207.219	6.201	2	.045
Age group	204.784	3.766	4	.439
Gender	202.819	1.801	2	.406
Qualification(s)	211.208	10.191	6	.117
Discipline	204.606	3.588	2	.166
Category	205.254	4.236	2	.120

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Logistic regression was used to examine whether there exists any relation between the dependent variable and the user characteristics. From table it is evident that institution has an effect on the awareness about the services of the NISCAIR.

4.4.8.3 INFLIBNET

Table 4.4.8.3 Relationship of the knowledge on INFLIBNET with academics characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	242.655	7.370	2	.025
Age group	238.691	3.406	4	.492
Gender	236.183	.898	2	.638
Qualification(s)	241.700	6.415	6	.378
Discipline	236.031	.746	2	.689
Category	237.339	2.055	2	.358

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Statistical tests were done using logistic regression to establish whether there exists any relation between the dependent variable and the user characteristics and are presented in the table 4.4.8.3. Table established that institution has an impact on the dependent variable.

4.4.8.4 DELNET

Table 4.4.8.4 Relationship of the knowledge on DELNET with academics characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	256.988	16.670	2	.000
Age group	242.958	2.639	4	.620
Gender	240.961	.642	2	.725
Qualification(s)	244.781	4.462	6	.614
Discipline	243.042	2.723	2	.256
Category	244.224	3.905	2	.142

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Logistic regression was used to ascertain whether here exists any relation between the dependent variable and the respondent's characteristics and is presented in table 4.4.8.4. Table shows that institution has an effect on the dependent variable.

Table 4.4.8.5 Relationship of dependent variable with academics characteristics

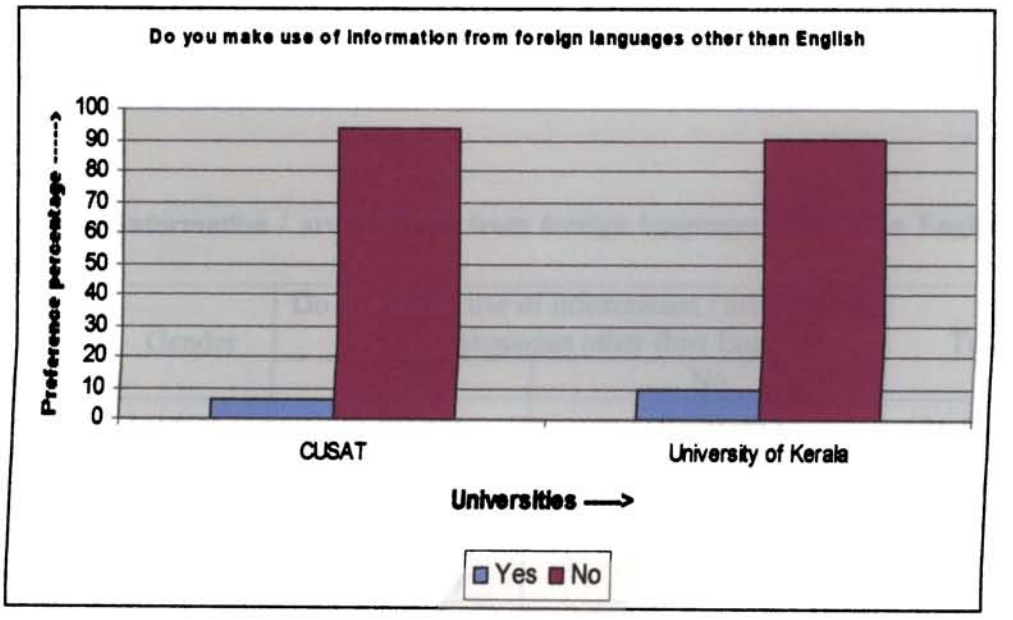
Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	232.859	4.424	3	.219
Age group	235.087	6.653	6	.354
Gender	236.840	8.406	3	.038
Qualification(s)	237.949	9.515	9	.391
Discipline	235.257	6.822	3	.078
Category	238.852	10.418	3	.015

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Logistic regression was used to test whether exists any relation between the dependent variable and user characteristics and is presented in the table 4.4.8.5. From table it is clear that there exists a relation between gender and category with the dependent variable.

4.4.9 Information / article usage from foreign languages other than English



Graph 4.4.9 Information / article usage from foreign languages other than English

Academics information utilization from languages other than English was studied and is presented in the graph 4.4.9. Above graph reveals that a very good number of the academics (more than 90%) in both the universities do not consult information from languages other than English.

Table 4.4.9.1 Information / article usage from foreign languages other than English Vs Age

		Age Group (Years)	Do you make use of information / article from foreign languages other than English		Total
			Yes	No	
University	CUSAT	Below 30	10 (5.5%)	173 (94.5%)	183 (100%)
		31- 45	5 (6.1%)	77 (93.9%)	82 (100%)
		46 and above	4 (8.9%)	41 (91.1%)	45 (100%)
		Total	19 (6.1%)	291 (93.9%)	310 (100%)
	University of Kerala	Below 30	16 (8.0%)	184 (92.0%)	200 (100%)
		31- 45	5 (13.2%)	33 (86.8%)	38 (100%)
		46 and above	4 (25.0%)	12 (75.0%)	16 (100%)
		Total	25 (9.8%)	229 (90.2%)	254 (100%)

Age wise analysis is presented in the table 4.4.9.1, from table we can infer that in both the universities as the age progress, the tendency not to use of information / article from foreign languages other than English decreases, and academics with in the age limit below 30 years, are more reluctant to use of information in languages other than English.

Table 4.4.9.2 Information / article usage from foreign languages other than English Vs Gender

		Gender	Do you make use of information / article from foreign languages other than English		Total
			Yes	No	
University	CUSAT	Male	16 (9.2%)	158 (90.8%)	174 (100%)
		Female	3 (2.2%)	133 (97.8%)	136 (100%)
		Total	19 (6.1%)	291 (93.9%)	310 (100%)
	University of Kerala	Male	16 (16.7%)	80 (83.3%)	96 (100%)
		Female	9 (5.7%)	149 (94.3%)	158 (100%)
		Total	25 (9.8%)	229 (90.2%)	254 (100%)

Gender wise analysis reveals that in both the universities, female academics are more reluctant to use information from languages other than English when compared to male academics.

Table 4.4.9.3 Information / article usage from foreign languages other than English Vs Discipline

		Discipline	Do you make use of information / article from foreign languages other than English		Total
			Yes	No	
University	CUSAT	Science	14 (7.4%)	176 (92.6%)	190 (100%)
		Technology	5 (4.2%)	115 (95.8%)	120 (100%)
		Total	19 (6.1%)	291 (93.9%)	310 (100%)
	University of Kerala	Science	21 (11.1%)	169 (88.9%)	190 (100%)
		Technology	4 (6.2%)	60 (93.8%)	64 (100%)
		Total	25 (9.8%)	229 (90.2%)	254 (100%)

Above table shows that technology academics of both the universities are more reluctant to use information / article from languages other than English when compared to science academics, and this trend is more evident in University of Kerala.

4.4.9.4 Information / article usage from foreign languages other than English Vs Category

Table 4.4.9.4.1 Information / article usage from foreign languages other than English Vs Teachers

		Category-Teachers	Do you make use of information / article from foreign languages other than English		Total
			Yes	No	
University	CUSAT	Lecturer	3 (4.3%)	67 (95.7%)	70 (100%)
		Reader	4 (13.8%)	25 (86.2%)	29 (100%)
		Professor	4 (19.0%)	17 (81.0%)	21 (100%)
		Total	11 (9.2%)	109 (90.8%)	120 (100%)
	University of Kerala	Lecturer	4 (10.3%)	35 (89.7%)	39 (100%)
		Reader	3 (27.3%)	8 (72.7%)	11 (100%)
		Professor	2 (40.0%)	3 (60.0%)	5 (100%)
		Total	9 (16.4%)	46 (83.6%)	55 (100%)

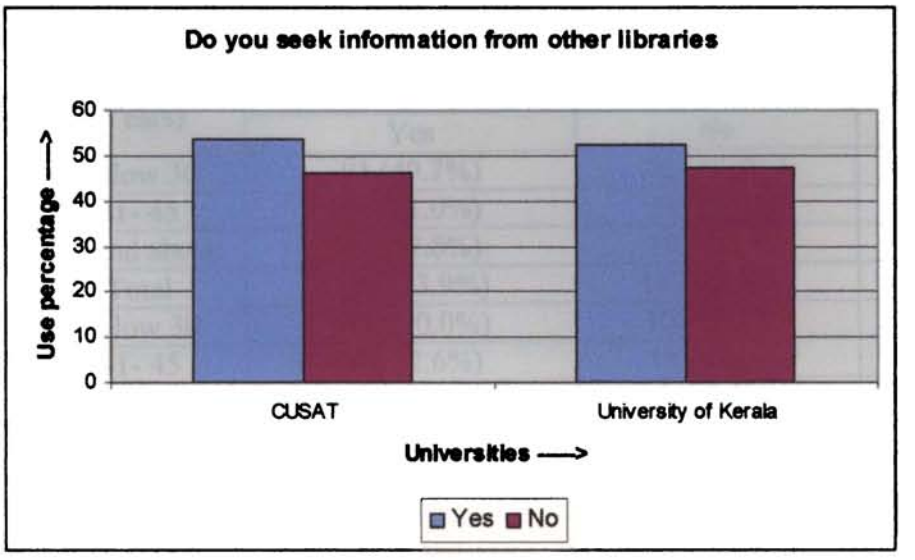
Teacher wise analysis reveals that in both the universities as the category increase the tendency not to use information from languages other than English decreases, which means that lecturers are more reluctant to use information from languages other than English.

Table 4.4.9.4.2 Information / article usage from foreign languages other than English Vs Research scholars

		Category-Researchers	Do you make use of information / article from foreign languages other than English		Total
			Yes	No	
University	CUSAT	Ph.D	7 (4.2%)	159 (95.8%)	166 (100%)
		M.Phil	1 (4.2%)	23 (95.8%)	24 (100%)
		Total	8 (4.2%)	182 (95.8%)	190 (100%)
	University of Kerala	Ph.D	13 (10.7%)	109 (89.3%)	122 (100%)
		M.Phil	3 (3.9%)	74 (96.1%)	77 (100%)
		Total	16 (8.0%)	183 (92.0%)	199 (100%)

Research scholar wise analysis shows that in CUSAT both categories of research scholars are in par as far as the information utilization from languages other than English is concerned. In University of Kerala M.Phil scholars are more reluctant to use information from foreign languages other than English.

4.4.10 Use of other libraries



Graph 4.4.10 Use of other libraries

Graphical analysis of academics' information seeking from libraries other than university library and department library is presented in the graph 4.4.10. From graph it is obvious that majority of the academics are secking information from other libraries, and such seeking is slightly higher in CUSAT.

Table 4.4.10.A.1 Use of other libraries Vs Discipline

		Discipline	Do you seek information from libraries other than university / department library		Total
			Yes	No	
University	CUSAT	Science	113 (59.5%)	77 (40.5%)	190 (100%)
		Technology	54 (45.0%)	66 (55.0%)	120 (100%)
		Total	167 (53.9%)	143 (46.1%)	310 (100%)
	University of Kerala	Science	106 (55.8%)	84 (44.2%)	190 (100%)
		Technology	27 (42.2%)	37 (57.8%)	64 (100%)
		Total	133 (52.4%)	121 (47.6%)	254 (100%)

Table 4.4.10.A.1 illustrates discipline wise analysis of academics usage of other libraries for information. Above table shows that science academics of both the universities, seek information more, from libraries other than university / department library when compared to technology academics.

Table 4.4.10.A.2 Use of other libraries Vs Age

		Age Group (Years)	Do you seek information from libraries other than university / department library		Total
			Yes	No	
University	CUSAT	Below 30	91 (49.7%)	92 (50.3%)	183 (100%)
		31- 45	50 (61.0%)	32 (39.0%)	82 (100%)
		46 and above	26 (57.8%)	19 (42.2%)	45 (100%)
		Total	167 (53.9%)	143 (46.1%)	310 (100%)
	University of Kerala	Below 30	100 (50.0%)	100 50.0%)	200 (100%)
		31- 45	20 (52.6%)	18 (47.4%)	38 (100%)
		46 and above	13 (81.2%)	3 (18.8%)	16 (100%)
		Total	133 (52.4%)	121 (47.6%)	254 (100%)

Age wise analysis shows that in CUSAT academics with in the age limit 31-45 and in University of Kerala academics with in the age limit 46 and above seek information from libraries other than university / department library

Table 4.4.10.A.3 Use of other libraries Vs Gender

		Gender	Do you seek information from libraries other than university / department library		Total
			Yes	No	
University	CUSAT	Male	102 (58.6%)	72 (41.4%)	174 (100%)
		Female	65 (47.8%)	71 (52.2%)	136 (100%)
		Total	167 (53.9%)	143 (46.1%)	310 (100%)
	University of Kerala	Male	58 (60.4%)	38 (39.6%)	96 (100%)
		Female	75 (47.5%)	83 (52.5%)	158 (100%)
		Total	133 (52.4%)	121 (47.6%)	254 (100%)

Above table shows that in both the universities, information gathering from other libraries is more among male academics.

4.4.10.A.4 Use of other libraries Vs Category

Table 4.4.10.A.4.1 Use of other libraries Vs Teachers

		Category-Teachers	Do you seek information from libraries other than university / department library		Total
			Yes	No	
University	CUSAT	Lecturer	39 (55.7%)	31 (44.3%)	70 (100%)
		Reader	18 (62.1%)	11 (37.9%)	29 (100%)
		Professor	15 (71.4%)	6 (28.6%)	21 (100%)
		Total	72 (60.0%)	48 (40.0%)	120 (100%)
	University of Kerala	Lecturer	17 (43.6%)	22 (56.4%)	39 (100%)
		Reader	7 (63.6%)	4 (36.4%)	11 (100%)
		Professor	4 (80.0%)	1 (20.0%)	5 (100%)
		Total	28 (50.9%)	27 (49.1%)	55 (100%)

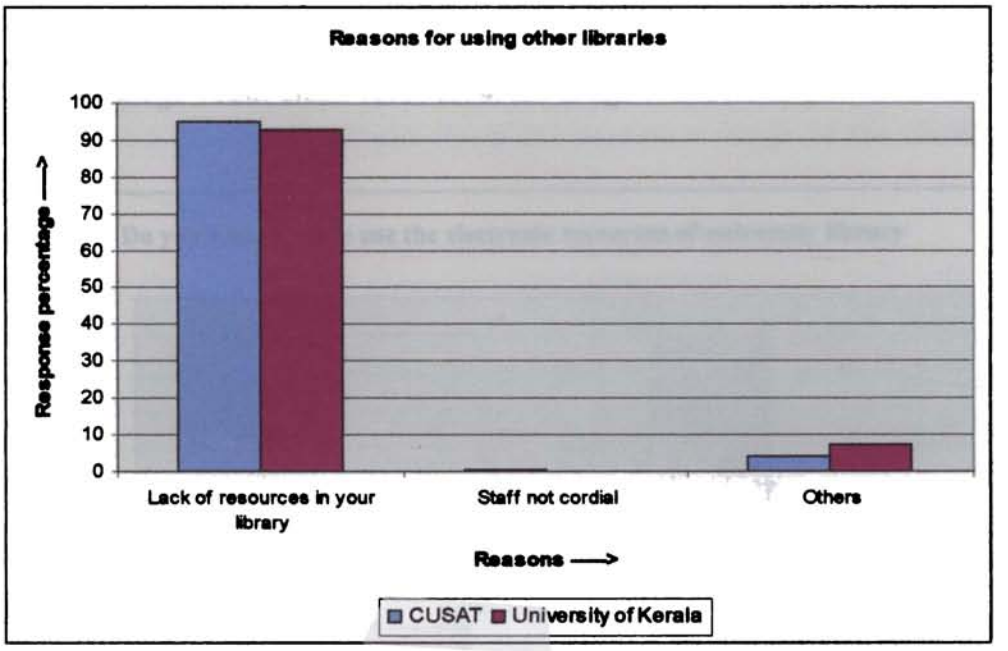
Teacher's category wise analysis is presented in the table 4.4.10.A.4.1. From table we can infer that in both the universities as the category increases, tendency to seek information from libraries other than university / department library also increases.

Table 4.4.10.A.4.2 Use of other libraries Vs Research scholars

		Category-Researchers	Do you seek information from libraries other than university / department library		Total
			Yes	No	
University	CUSAT	Ph.D	84 (50.6%)	82 (49.4%)	166 (100%)
		M.Phil	11 (45.8%)	13 (54.2%)	24 (100%)
		Total	95 (50.0%)	95 (50.0%)	190 (100%)
	University of Kerala	Ph.D	73 (59.8%)	49 (40.2%)	122 (100%)
		M.Phil	32 (41.6%)	45 (58.4%)	77 (100%)
		Total	105 (52.8%)	94 (47.2%)	199 (100%)

Research scholar wise use of other libraries was analysed and is presented in the table 4.4.10.A.4.2. Table reveals that Ph.D scholars of both the universities are using other libraries more when compared to M.Phil scholars.

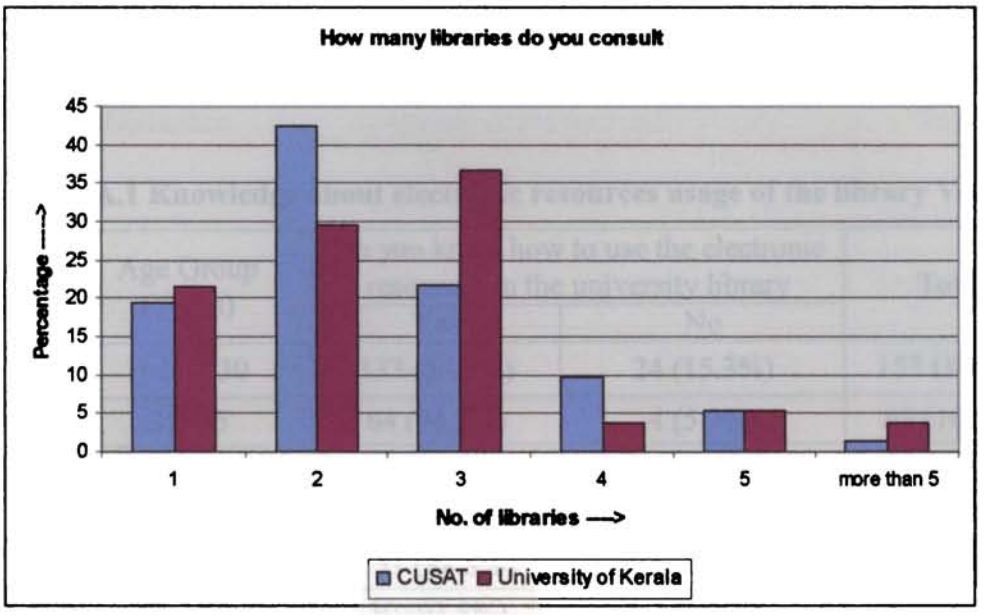
4.4.10.B Reasons for using other libraries



Graph 4.4.10.B Reasons for using other libraries

Above graph illustrates the reasons for using other libraries. From graph it is evident that lack of resources is the main reason of academics in consulting other libraries.

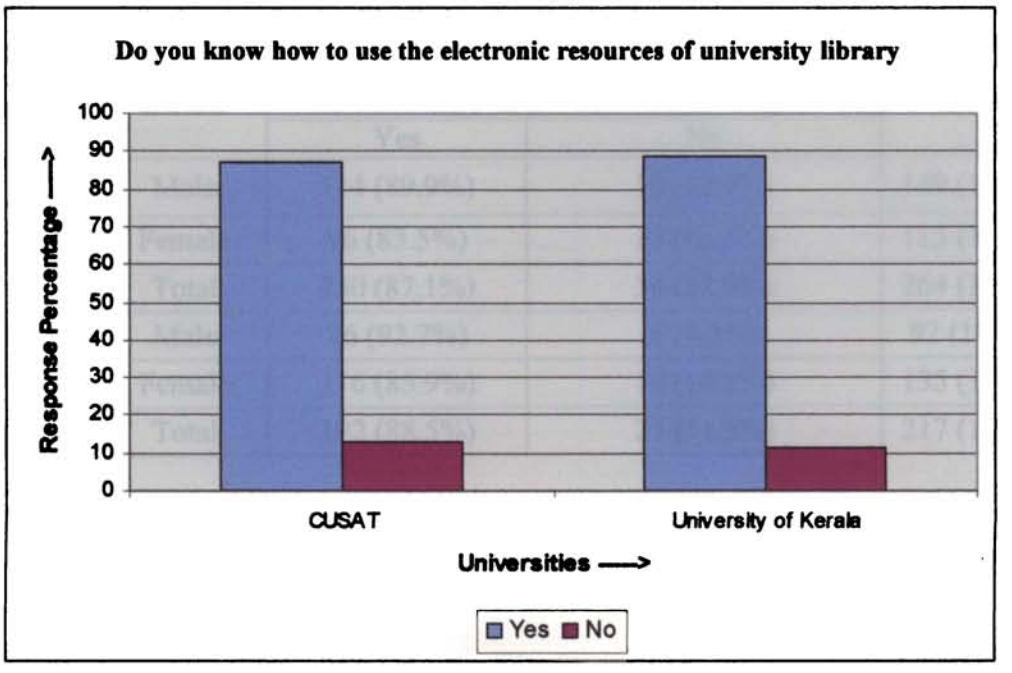
4.4.10.C How many libraries do you consult



Graph 4.4.10.C How many libraries do you consult

Graph shows that a good majority of the academics (more than 80%) are not consulting more than three libraries for their information requirements.

4.4.11 Knowledge about electronic resources usage of the library



Graph 4.4.11.A Knowledge about electronic resources usage of the library

A very good number of academics of both the universities know how to use the electronic resources of the library, and the number is slightly higher in the case of academics in University of Kerala.

Table 4.4.11.A.1 Knowledge about electronic resources usage of the library Vs Age

		Age Group (Years)	Do you know how to use the electronic resources in the university library		Total
			Yes	No	
University	CUSAT	Below 30	133 (84.7%)	24 (15.3%)	157 (100%)
		31- 45	64 (94.1%)	4 (5.9%)	68 (100%)
		46 and above	33 (84.6%)	6 (15.4%)	39 (100%)
		Total	230 (87.1%)	34 (12.9%)	264 (100%)
	University of Kerala	Below 30	151 (88.3%)	20 (11.7%)	171 (100%)
		31- 45	30 (93.8%)	2 (6.2%)	32 (100%)
		46 and above	11 (78.6%)	3 (21.4%)	14 (100%)
		Total	192 (88.5%)	25 (11.5%)	217 (100%)

Age wise analysis shows that in both the universities, academics with in the age limit 31-45 have knowledge about how to use the electronic resources of the library.

Table 4.4.11.A.2 Knowledge about electronic resources usage of the library Vs Gender

		Gender	Do you know how to use the electronic resources in the university library		Total
			Yes	No	
University	CUSAT	Male	134 (89.9%)	15 (10.1%)	149 (100%)
		Female	96 (83.5%)	19 (16.5%)	115 (100%)
		Total	230 (87.1%)	34 (12.9%)	264 (100%)
	University of Kerala	Male	76 (92.7%)	6 (7.3%)	82 (100%)
		Female	116 (85.9%)	19 (14.1%)	135 (100%)
		Total	192 (88.5%)	25 (11.5%)	217 (100%)

Gender wise analysis shows that male academics are more aware about the techniques of the usage of electronic resources.

Table 4.4.11.A.3 Knowledge about electronic resources usage of the library Vs Discipline

		Discipline	Do you know how to use the electronic resources in the university library		Total
			Yes	No	
University	CUSAT	Science	131 (81.9%)	29 (18.1%)	160 (100%)
		Technology	99 (95.2%)	5 (4.8%)	104 (100%)
		Total	230 (87.1%)	34 (12.9%)	264 (100%)
	University of Kerala	Science	144 (86.2%)	23 (13.8%)	167 (100%)
		Technology	48 (96.0%)	2 (4.0%)	50 (100%)
		Total	192 (88.5%)	25 (11.5%)	217 (100%)

Knowledge regarding the use of electronic resources of the library is studied discipline wise and is presented in the table 4.4.11.A.3. Table shows that in both the universities technology academics are more aware of the techniques of electronic resource searching.

4.4.11.A.4 Knowledge about electronic resources usage of the library Vs Category

Table 4.4.11.A.4.1 Teachers

		Category-Teachers	Do you know how to use the electronic resources in the university library		Total
			Yes	No	
University	CUSAT	Lecturer	53 (91.4%)	5 (8.6%)	58(100%)
		Reader	21 (87.5%)	3 (12.5%)	24 (100%)
		Professor	17 (89.5%)	2 (10.5%)	19 (100%)
		Total	91 (90.1%)	10 (9.9%)	101 (100%)
	University of Kerala	Lecturer	28 (93.3%)	2 (6.7%)	30 (100%)
		Reader	7 (87.5%)	1 (12.5%)	8 (100%)
		Professor	4 (80.0%)	1 (20.0%)	5 (100%)
		Total	39 (90.7%)	4 (9.3%)	43 (100%)

Teachers wise analysis reveals that in both the universities Lecturers know how to use the electronic resources more, than other category of teachers.

Table 4.4.11.A.4.2 Research scholars

		Category-Researchers	Do you know how to use the electronic resources in the university library		Total
			Yes	No	
University	CUSAT	Ph.D	128 (88.9%)	16 (11.1%)	144 (100%)
		M.Phil	11 (57.9%)	8 (42.1%)	19 (100%)
		Total	139 (85.3%)	24 (14.7%)	163 (100%)
	University of Kerala	Ph.D	100 (90.9%)	10 (9.1%)	110 (100%)
		M.Phil	53 (82.8%)	11 (17.2%)	64 (100%)
		Total	153 (87.9%)	21 (12.1%)	174 (100%)

Research scholar wise investigation reveals that Ph.D scholars are more aware of how to use the electronic resources of the library.

Table 4.4.11.A Relationship of dependent variable with academics' characteristics

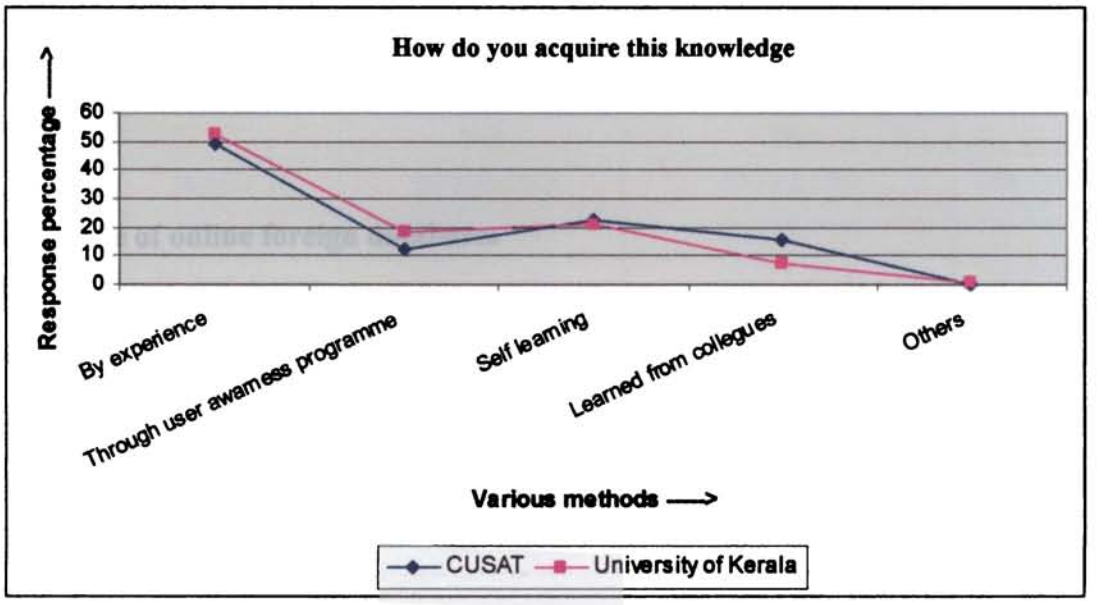
Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	270.247	9.887	4	.042
Age group	271.609	11.248	8	.188
Gender	265.257	4.897	4	.298
Qualification(s)	270.644	10.283	12	.591
Discipline	264.588	4.228	4	.376
Category	260.780	.420	4	.981

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Academics knowledge about how to use the electronic resources of the university library was statistically verified for any relation with user characteristics and is presented in the table 4.4.11.A. From table it is clear that institution has an impact on the dependent variable.

4.4.11.B How do you acquire this knowledge?



Graph 4.4.11.B How do you acquire this knowledge?

Academics of both universities acquire the knowledge of using the electronic resources either by experience or by self learning. Graph shows a similar pattern knowledge acquisition in both universities. Even though majority of the users are aware of the user awareness programmes conducted by the respective university libraries, these programmes have no impact on the user community as they acquire knowledge in using the electronic resources through experience.

Table 4.4.11.B Relationship of dependent variable with academics characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	102.139(b)	2.951	4	.566
Age group	101.219(b)	2.032	8	.980
Gender	108.011(b)	8.824	4	.066
Qualification(s)	119.187(b)	20.000	12	.067
Discipline	123.768(b)	24.581	4	.000
Category	180.214(b)	81.026	4	.000

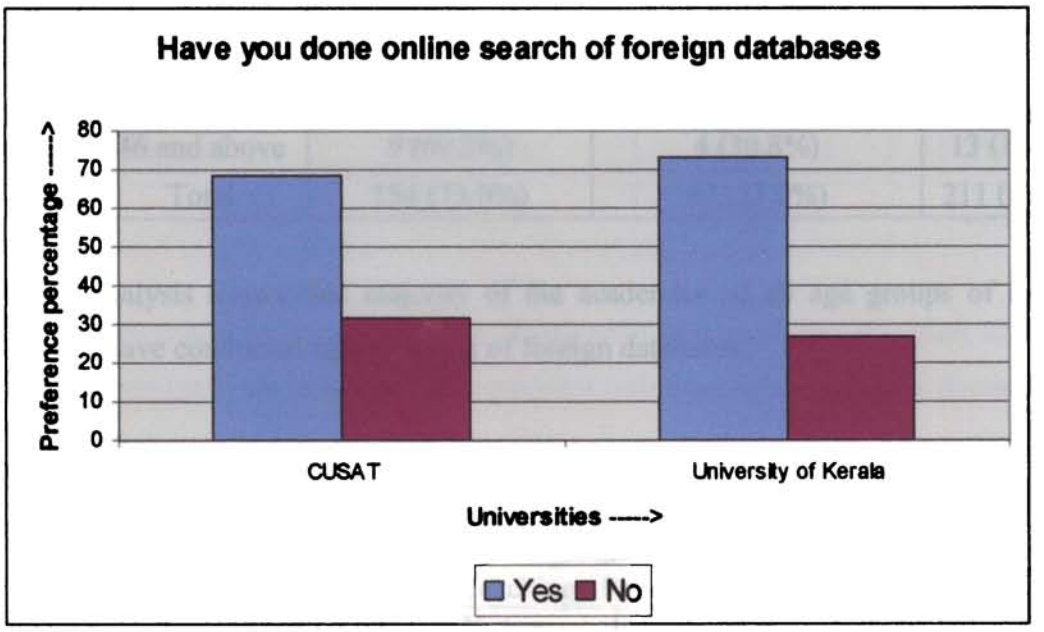
The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

b Unexpected singularities in the Hessian matrix are encountered. This indicates that either some predictor variables should be excluded or some categories should be merged.

Logistic regression was used to test whether exists any relation between the dependent variable and user characteristics and is presented in the table 4.4.11.B. From table it is clear that there exists a relation between discipline and category with the dependent variable.

4.4.12 Use of online foreign databases



Graph 4.4.12 Use of online foreign databases

An overall analysis of the above graph reveals that most of the academics, 68.5% in CUSAT and 73% in University of Kerala have used online search of foreign databases for their academic purpose, and academics of University of Kerala are using online search more.

Table 4.4.12.1 Use of online foreign databases Vs Age

		Age Group (Years)	Have you done online search of foreign databases to get information regarding your Teaching / Research / Guidance		Total
			Yes	No	
University	CUSAT	Below 30	99 (66.9%)	49 (33.1%)	148 (100%)
		31- 45	45 (64.3%)	25 (35.7%)	70 (100%)
		46 and above	32 (82.1%)	7 (17.9%)	39 (100%)
		Total	176 (68.5%)	81 (31.5%)	257 (100%)
	University of Kerala	Below 30	116 (69.9%)	50 (30.1%)	166 (100%)
		31- 45	29 (90.6%)	3 (9.4%)	32 (100%)
		46 and above	9 (69.2%)	4 (30.8%)	13 (100%)
		Total	154 (73.0%)	57 (27.0%)	211 (100%)

Age wise analysis shows that majority of the academics of all age groups of both universities have conducted online search of foreign databases.

Table 4.4.12.2 Use of online foreign databases Vs Gender

		Gender	Have you done online search of foreign databases to get information regarding your Teaching / Research / Guidance		Total
			Yes	No	
University	CUSAT	Male	112 (75.2%)	37 (24.8%)	149 (100%)
		Female	64 (59.3%)	44 (40.7%)	108 (100%)
		Total	176 (68.5%)	81 (31.5%)	257 (100%)
	University of Kerala	Male	60 (76.9%)	18 (23.1%)	78 (100%)
		Female	94 (70.7%)	39 (29.3%)	133 (100%)
		Total	154 (73.0%)	57 (27.0%)	211 (100%)

Gender wise analysis on online database search of foreign databases is examined and is presented in the table 4.4.12.2. Table shows that male academics of both the universities use online searching of foreign databases more, when compared to female academics.

Table 4.4.12.3 Use of online foreign databases Vs Discipline

		Discipline	Have you done online search of foreign databases to get information regarding your Teaching / Research / Guidance		Total
			Yes	No	
University	CUSAT	Science	112 (70.9%)	46 (29.1%)	158(100%)
		Technology	64 (64.6%)	35 (35.4%)	99 (100%)
		Total	176 (68.5%)	81 (31.5%)	257 (100%)
	University of Kerala	Science	118 (73.8%)	42 (26.3%)	160 (100%)
		Technology	36 (70.6%)	15 (29.4%)	51 (100%)
		Total	154 (73.0%)	57 (27.0%)	211 (100%)

Discipline wise analysis is presented in the above table, and from table it is clear that in both the universities, science academics perform online search of foreign databases more when compared to technology academics.

4.4.12.4 Use of online foreign databases Vs Category

Table 4.4.12.4.1 Use of online foreign databases Vs Teachers

		Category-Teachers	Have you done online search of foreign databases to get information regarding your Teaching / Research / Guidance		Total
			Yes	No	
University	CUSAT	Lecturer	40 (66.7%)	20 (33.3%)	60 (100%)
		Reader	19 (76.0%)	6 (24.0%)	25 (100%)
		Professor	15 (88.2%)	2 (11.8%)	17 (100%)
		Total	74 (72.5%)	28 (27.5%)	102 (100%)
	University of Kerala	Lecturer	22 (71.0%)	9 (29.0%)	31 (100%)
		Reader	6 (75.0%)	2 (25.0%)	8 (100%)
		Professor	3 (100.0%)	0 (0%)	3 (100%)
		Total	31 (73.8%)	11 (26.2%)	42 (100%)

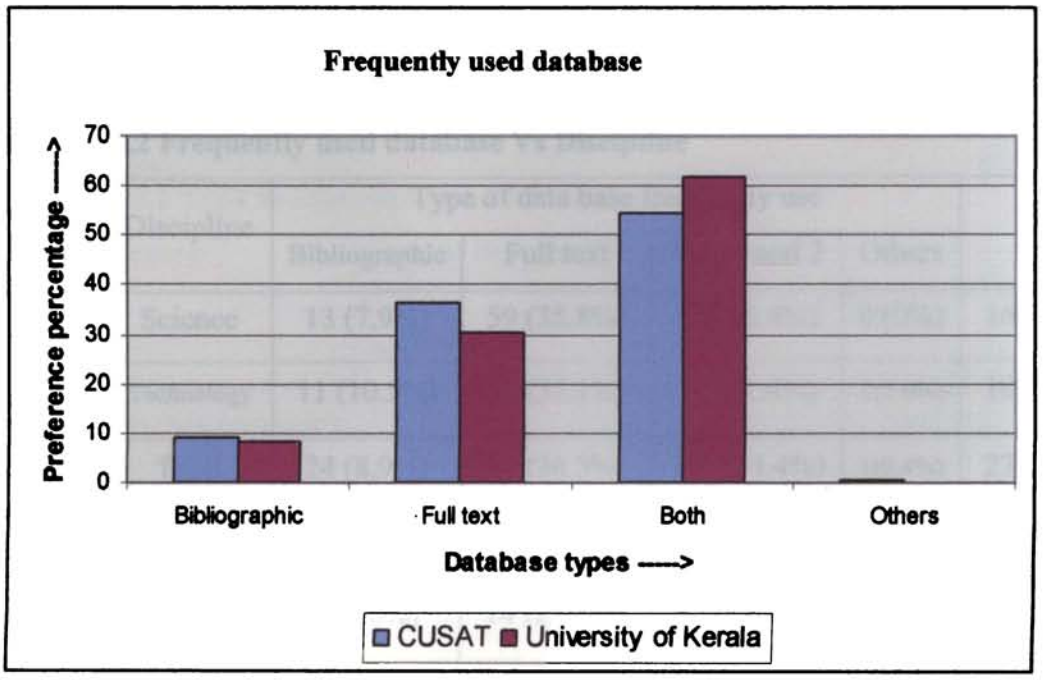
Teachers' foreign databases usage is analysed and is presented in the table 4.4.12.4.1. Table shows that in both the universities, the tendency to use online search of foreign databases increases with experiences.

Table 4.4.12.4.2 Use of online foreign databases Vs Researchers

		Category-Researchers	Have you done online search of foreign databases to get information regarding your Teaching / Research / Guidance		Total
			Yes	No	
University	CUSAT	Ph.D	94 (66.2%)	48 (33.8%)	142 (100%)
		M.Phil	8 (61.5%)	5 (38.5%)	13 (100%)
		Total	102 (65.8%)	53 (34.2%)	155 (100%)
	University of Kerala	Ph.D	91 (81.3%)	21 (18.8%)	112 (100%)
		M.Phil	32 (56.1%)	25 (43.9%)	57 (100%)
		Total	123 (72.8%)	46 (27.2%)	169 (100%)

Analysis of researchers shows that Ph.D scholars of both the universities are more familiar and using with foreign databases when compared to M.Phil scholars.

4.4.13 Frequently used database



Graph 4.4.13 Frequently used database

A graphical presentation of academics preference on various types of databases is shown in the graph 4.4.13. Graph shows that academics prefer both full text and bibliographic databases, and preference is high in University of Kerala.

Table 4.4.13.1 Frequently used database Vs Age

		Age group (Years)	Type of data base frequently use				Total
			Bibliographic	Full text	Both 1and 2	Others	
University	CUSAT	Below 30	11 (7.1%)	60 (38.5%)	85 (54.5%)	0 (0%)	156 (100%)
		31- 45	8 (10.8%)	30 (40.5%)	35 (47.3%)	1 (1.4%)	74 (100%)
		46 and above	5 (12.5%)	8 (20.0%)	27 (67.5%)	0 (0%)	40 (100%)
		Total	24 (8.9%)	98 (36.3%)	147 (54.4%)	1 (0.4%)	270 (100%)
	University of Kerala	Below 30	14 (8.1%)	50 (29.1%)	108 (62.8%)	0 (0%)	172 (100%)
		31- 45	3 (9.4%)	13 (40.6%)	16 (50.0%)	0 (0%)	32 (100%)
		46 and above	1 (6.7%)	3 (20.0%)	11 (73.3%)	0 (0%)	15 (100%)
		Total	18 (8.2%)	66 (30.1%)	135 (61.6%)	0 (0%)	219 (100%)

Above table shows that both the databases were preferred by the academics and an age wise analysis reveals that majority, (67.5% in CUSAT and 73.3% in University of Kerala) of those who prefer both the databases are academics with in the age limit 46 and above.

Table 4.4.13.2 Frequently used database Vs Discipline

		Discipline	Type of data base frequently use				Total
			Bibliographic	Full text	Both 1and 2	Others	
University	CUSAT	Science	13 (7.9%)	59 (35.8%)	93 (56.4%)	0 (0%)	165 (100%)
		Technology	11 (10.5%)	39 (37.1%)	54 (51.4%)	1(1.0%)	105 (100%)
		Total	24 (8.9%)	98 (36.3%)	147 (54.4%)	1(0.4%)	270 (100%)
	University of Kerala	Science	17 (10.4%)	52 (31.7%)	95 (57.9%)	0 (0%)	164 (100%)
		Technology	1 (1.8%)	14 (25.5%)	40 (72.7%)	0 (0%)	55 (100%)
		Total	18 (8.2%)	66 (30.1%)	135 (61.6%)	0 (0%)	219 (100%)

Discipline wise study reveals that a good number of science academics as well as technology academics are using both databases for their information requirements. Comparative analysis shows that academics of University of Kerala (61.6%) are using these databases more when compared to academics of CUSAT.

Table 4.4.13.3 Frequently used database Vs Gender

		Gender	Type of data base frequently use				Total
			Bibliographic	Full text	Both 1and 2	Others	
University	CUSAT	Male	16 (10.5%)	50 (32.7%)	86 (56.2%)	1(0.7%)	153 (100%)
		Female	8 (6.8%)	48 (41.0%)	61 (52.1%)	0 (0%)	117 (100%)
		Total	24 (8.9%)	98 (36.3%)	147 (54.4%)	1(0.4%)	270 (100%)
	University of Kerala	Male	9 (11.0%)	29 (35.4%)	44 (53.7%)	0 (0%)	82 (100%)
		Female	9 (6.6%)	37 (27.0%)	91 (66.4%)	0 (0%)	137 (100%)
		Total	18 (8.2%)	66 (30.1%)	135 (61.6%)	0 (0%)	219 (100%)

Table 4.4.13.3 illustrates a gender wise analysis of academics preference on various types of databases. From table it is evident that even though academics prefer both types of databases, full text databases are their favorite choice. More number of female academics (66.4%) of University of Kerala is using both databases when compared to male academics, but in CUSAT situation is different.

4.4.13.3 Frequently used database Vs Category

Table 4.4.13.3.1 Type Frequently used database Vs Teachers

		Category - Teachers	Type of data base frequently use				Total
			Bibliographic	Full text	Both 1and 2	Others	
University	CUSAT	Lecturer	6 (9.7%)	24 (38.7%)	31 (50.0%)	1 (1.6%)	62 (100%)
		Reader	6 (24.0%)	7 (28.0%)	12 (48.0%)	0 (0%)	25 (100%)
		Professor	2 (10.5%)	4 (21.1%)	13 (68.4%)	0 (0%)	19 (100%)
		Total	14 (13.2%)	35 (33.0%)	56 (52.8%)	1 (0.9%)	106 (100%)
	University of Kerala	Lecturer	1 (2.7%)	8 (21.6%)	28 (75.7%)	0 (0%)	37 (100%)
		Reader	2 (25.0%)	4 (50.0%)	2 (25.0%)	0 (0%)	8 (100%)
		Professor	0 (0%)	0 (0%)	5 (100.0%)	0 (0%)	5 (100%)
		Total	3 (6.0%)	12 (24.0%)	35 (70.0%)	0 (0%)	50 (100%)

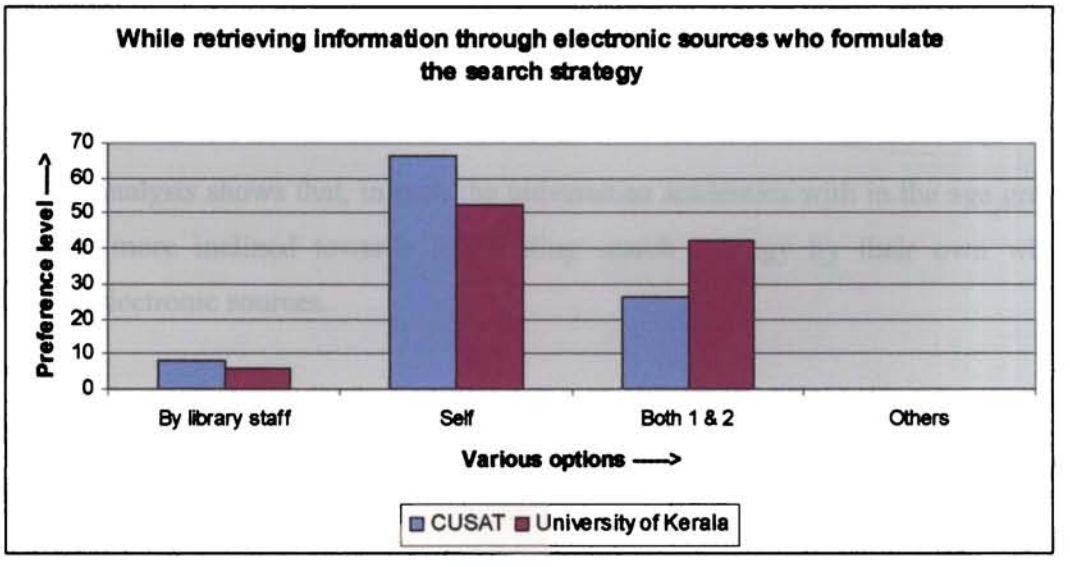
Teacher wise analysis shows that a good number of teachers, 52.8% in CUSAT and 70.0% in University of Kerala are aware of both databases and are using it. When compared with different categories of teachers, Professors of both the universities are using the databases more.

Table 4.4.13.3.2 Frequently used database Vs Research scholars

		Category - Researchers	Type of data base frequently use			Total
			Bibliographic	Full text	Both 1and 2	
University	CUSAT	Ph.D	9 (6.2%)	55 (37.7%)	82 (56.2%)	146 (100%)
		M.Phil	1 (5.6%)	8 (44.4%)	9 (50.0%)	18 (100%)
		Total	10 (6.1%)	63 (38.4%)	91 (55.5%)	164 (100%)
	University of Kerala	Ph.D	8 (7.4%)	39 (36.1%)	61 (56.5%)	108 (100%)
		M.Phil	7 (11.5%)	15 (24.6%)	39 (63.9%)	61 (100%)
		Total	15 (8.9%)	54 (32.0%)	100 (59.1%)	169 (100%)

Above table shows that majority (55.5% in CUSAT and 59.1% in University of Kerala) of the researchers of both the universities is aware of different databases and is using it for their information requirements.

4.4.14 While retrieving information through electronic sources who formulate the search strategy?



Graph 4.4.14 While retrieving information through electronic sources who formulate the search strategy?

Majority of the academics prefer to formulate search strategy by their own while retrieving information from electronic sources. Comparative analysis shows that more number of academics of CUSAT (66%) prefer to formulate search strategy by their own, than academics of University of Kerala (52.2%).

Table 4.4.14.1 While retrieving information through electronic sources who formulate the search strategy? Vs Age

		Age group (Years)	While retrieving information through electronic sources who formulate strategy			Total
			By library staff	Self	Both 1 & 2	
University	CUSAT	Below 30	13 (8.4%)	98 (63.6%)	43 (27.9%)	154 (100%)
		31- 45	5 (7.1%)	49 (70.0%)	16 (22.9%)	70 (100%)
		46 and above	3 (7.9%)	26 (68.4%)	9 (23.7%)	38 (100%)
		Total	21 (8.0%)	173 (66.0%)	68 (26.0%)	262 (100%)
	University of Kerala	Below 30	12 (6.7%)	90 (50.3%)	77 (43.0%)	179 (100%)
		31- 45	0 (0.0%)	22 (68.8%)	10 (31.2%)	32 (100%)
		46 and above	1 (6.7%)	6 (40.0%)	8 (53.3%)	15 (100%)
		Total	13 (5.8%)	118 (52.2%)	95 (42.0%)	226 (100%)

Age wise analysis shows that, in both the universities academics with in the age group 31-45 are more inclined towards formulating search strategy by their own while searching electronic sources.

Table 4.4.14.2 While retrieving information through electronic sources who formulate the search strategy? Vs Gender

		Gender	While retrieving information through electronic sources who formulate strategy			Total
			By library staff	Self	Both 1 & 2	
University	CUSAT	Male	13 (8.6%)	106 (70.2%)	32 (21.2%)	151 (100%)
		Female	8 (7.2%)	67 (60.4%)	36 (32.4%)	111 (100%)
		Total	21 (8.0%)	173 (66.0%)	68 (26.0%)	262 (100%)
	University of Kerala	Male	3 (3.5%)	50 (58.1%)	33 (38.4%)	86 (100%)
		Female	10 (7.1%)	68 (48.6%)	62 (44.3%)	140 (100%)
		Total	13 (5.8%)	118 (52.2%)	95 (42.0%)	226 (100%)

Above table shows that more number of male academics of both the universities prefer to formulate search strategy by their own when compared to female academics.

Table 4.4.14.3 While retrieving information through electronic sources who formulate the search strategy? Vs Discipline

		Discipline	While retrieving information through electronic sources who formulate strategy			Total
			By library staff	Self	Both 1 & 2	
University	CUSAT	Science	15 (9.4%)	107 (66.9%)	38 (23.8%)	160 (100%)
		Technology	6 (5.9%)	66 (64.7%)	30 (29.4%)	102 (100%)
		Total	21 (8.0%)	173 (66.0%)	68 (26.0%)	262 (100%)
	University of Kerala	Science	12 (7.0%)	88 (51.5%)	71 (41.5%)	171 (100%)
		Technology	1 (1.8%)	30 (54.5%)	24 (43.6%)	55 (100%)
		Total	13 (5.8%)	118 (52.2%)	95 (42.0%)	226 (100%)

Discipline wise analysis shows that more number of science academics in CUSAT and technology academics in University of Kerala prefers to formulate search strategy by their own.

4.4.14.4 While retrieving information through electronic sources who formulate the search strategy? Vs Category

Table 4.4.14.4.1 While retrieving information through electronic sources who formulate the search strategy? Vs Teachers

		Category – Teachers	While retrieving information through electronic sources who formulate strategy			Total
			By library staff	Self	Both 1 & 2	
University	CUSAT	Lecturer	7 (11.9%)	41 (69.5%)	11 (18.6%)	59 (100%)
		Reader	1 (4.2%)	16 (66.7%)	7 (29.2%)	24 (100%)
		Professor	0 (0.0%)	14 (82.4%)	3 (17.6%)	17 (100%)
		Total	8 (8.0%)	71 (71.0%)	21 (21.0%)	100 (100%)
	University of Kerala	Lecturer	2 (5.4%)	21 (56.8%)	14 (37.8%)	37 (100%)
		Reader	0 (0.0%)	5 (55.6%)	4 (44.4%)	9 (100%)
		Professor	0 (0.0%)	1 (20.0%)	4 (80.0%)	5 (100%)
		Total	2 (3.9%)	27 (52.9%)	22 (43.1%)	51 (100%)

Teacher's category wise analysis shows that Professors in CUSAT and Lecturers in University of Kerala are relying more on their expertise to formulate the search strategy while seeking information from electronic sources.

Table 4.4.14.4.2 While retrieving information through electronic sources who formulate the search strategy? Vs Research scholars

		Category - Researchers	While retrieving information through electronic sources who formulate strategy			Total
			By library staff	Self	Both 1 & 2	
University	CUSAT	Ph.D	13 (8.8%)	93 (62.8%)	42 (28.4%)	148 (100%)
		M.Phil	0 (0.0%)	9 (64.3%)	5 (35.7%)	14 (100%)
		Total	13 (8.0%)	102 (63.0%)	47 (29.0%)	162 (100%)
	University of Kerala	Ph.D	4 (3.6%)	68 (60.7%)	40 (35.7%)	112 (100%)
		M.Phil	7 (11.1%)	23 (36.5%)	33 (52.4%)	63 (100%)
		Total	11 (6.3%)	91 (52.0%)	73 (41.7%)	175 (100%)

Table 4.4.14.4.2 reveals that more number of M.Phil scholars in CUSAT and Ph.D scholars in University of Kerala is formulating search strategy on their own.

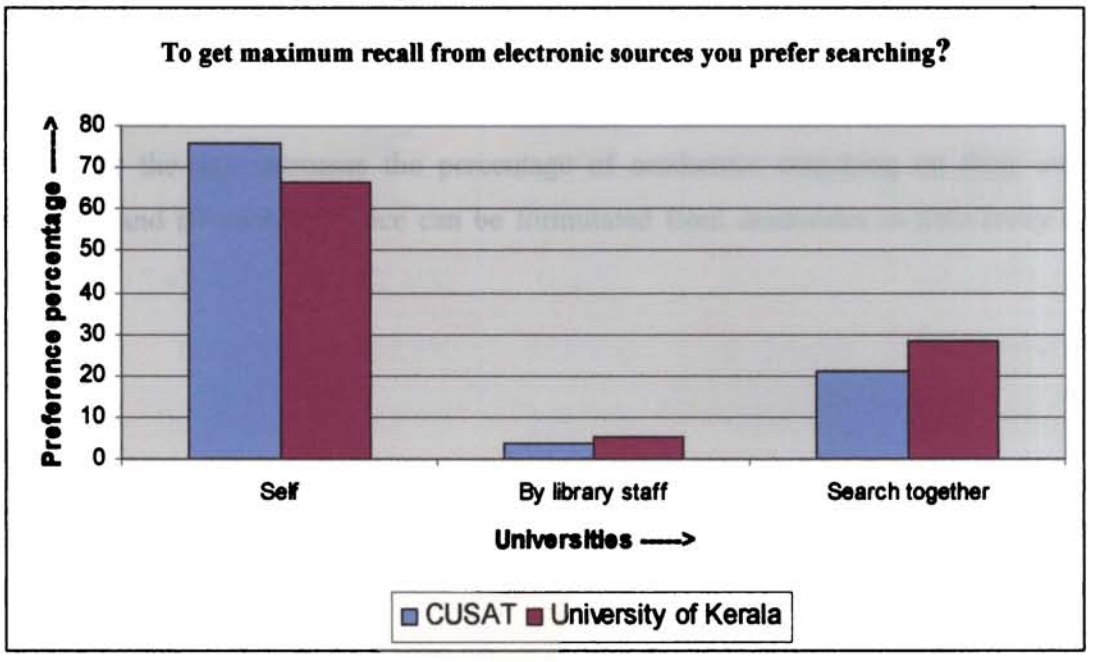
Table 4.4.14 Relationship of dependent variable with academics' characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	326.804	5.684	2	.058
Age Group	324.813	3.693	4	.449
Gender	325.273	4.153	2	.125
Qualification	326.199	5.079	8	.749
Category	335.413	14.293	8	.074
Discipline	325.015	3.895	2	.143

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The dependent variable is statistically tested using nominal regression for any relation with various variables like institution, age group, gender, qualification, category and discipline and is presented in the table 4.4.14. From table it is clear that institution has an impact on the formulation of search strategy.

4.4.15 Searching methods to get maximum recall from electronic sources



Graph 4.4.15 Searching methods to get maximum recall from electronic sources

In order to get maximum recall from electronic sources, a good number of academics prefer to search without the help of library staff. On comparison of such activities in both universities, we can see that the confidence level of academicians in seeking information through electronic sources by themselves is high in CUSAT. Thompson (Thompson, 2007) also proved a high confidence level among the respondents in their search abilities on electronic source. As far as electronic source searching is concerned, librarian's skills are under utilized.

Table 4.4.15.1 Searching methods to get maximum recall from electronic sources Vs Age

		Age group	To get maximum recall from electronic sources you prefer searching			Total
			Self	By library staff	Search together	
University	CUSAT	Below 30	122 (77.7%)	5 (3.2%)	30 (19.1%)	157 (100%)
		31- 45	53 (73.6%)	3 (4.2%)	16 (22.2%)	72 (100%)
		46 and above	29 (72.5%)	1 (2.5%)	10 (25.0%)	40 (100%)
		Total	204 (75.8%)	9 (3.3%)	56 (20.8%)	269 (100%)
	University of Kerala	Below 30	115 (63.9%)	11 (6.1%)	54 (30.0%)	180 (100%)
		31- 45	24 (80.0%)	0 (0%)	6 (20.0%)	30 (100%)
		46 and above	11 (68.8%)	1 (6.3%)	4 (25.0%)	16 (100%)
		Total	150 (66.4%)	12 (5.3%)	64 (28.3%)	226 (100%)

Age wise analysis is tabulated in the table 4.4.15.1 and from table we can infer that, in CUSAT as the age increases the percentage of academics searching on their own decreases, and no such inference can be formulated from academics in University of Kerala.

Table 4.4.15.2 Searching methods to get maximum recall from electronic sources Vs Gender

		Gender	To get maximum recall from electronic sources you prefer searching			Total
			Self	By library staff	Search together	
University	CUSAT	Male	122 (80.3%)	1 (0.6%)	29 (19.1%)	152 (100%)
		Female	82 (70.1%)	8 (6.8%)	27 (23.1%)	117 (100%)
		Total	204 (75.8%)	9 (3.4%)	56 (20.8%)	269 (100%)
	University of Kerala	Male	62 (72.1%)	6 (7.0%)	18 (20.9%)	86 (100%)
		Female	88 (62.9%)	6 (4.3%)	46 (32.8%)	140 (100%)
		Total	150 (66.4%)	12 (5.3%)	64 (28.3%)	226 (100%)

Gender wise analysis is shown in the table 4.4.15.2. Table reveals that in both the universities when compared to female academics, male academics prefer to search themselves more.

Table 4.4.15.3 Searching methods to get maximum recall from electronic sources Vs Discipline

		Discipline	To get maximum recall from electronic sources you prefer searching			Total
			Self	By library staff	Search together	
University	CUSAT	Science	127 (77.9%)	9 (5.5%)	27 (16.6%)	163 (100%)
		Technology	77 (72.6%)	0 (0%)	29 (27.4%)	106 (100%)
		Total	204 (75.8%)	9 (3.4%)	56 (20.8%)	269 (100%)
	University of Kerala	Science	112 (65.9%)	8 (4.7%)	50 (29.4%)	170 (100%)
		Technology	38 (67.9%)	4 (7.1%)	14 (25.0%)	56 (100%)
		Total	150 (66.4%)	12 (5.3%)	64 (28.3%)	226 (100%)

Discipline wise analysis shows that, approach of academics towards electronic source searching are roughly alike.

4.4.15.4 Searching methods to get maximum recall from electronic sources

4.4.15.4.1 Searching methods to get maximum recall from electronic sources Vs Teachers

		Category - Teachers	To get maximum recall from electronic sources you prefer searching			Total
			Self	By library staff	Search together	
University	CUSAT	Lecturer	46 (76.7%)	2 (3.3%)	12 (20.0%)	60 (100%)
		Reader	21 (77.8%)	1 (3.7%)	5 (18.5%)	27 (100%)
		Professor	14 (77.8%)	0 (0%)	4 (22.2%)	18 (100%)
		Total	81 (77.1%)	3 (2.9%)	21 (20.0%)	105 (100%)
	University of Kerala	Lecturer	27 (73.0%)	2 (5.4%)	8 (21.6%)	37 (100%)
		Reader	4 (50.0%)	0 (0%)	4(50.0%)	8 (100%)
		Professor	5 (100%)	0 (0%)	0 (0%)	5 (100%)
		Total	36 (72.0%)	2 (4.0%)	12 (24.0%)	50 (100%)

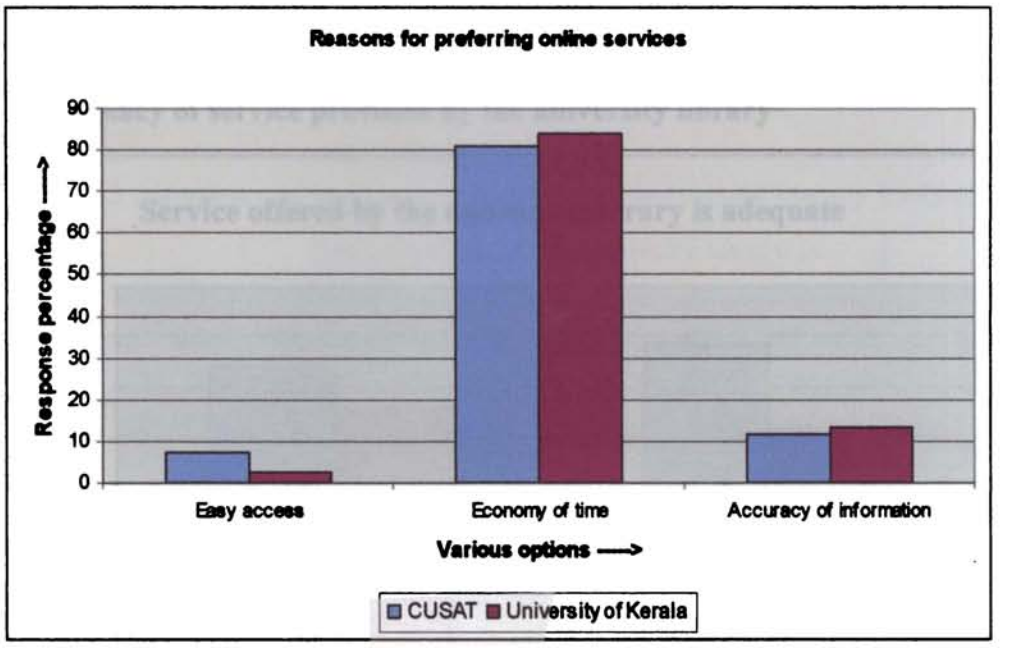
Category wise analysis reveals that Professors and Readers in CUSAT and Professors in University of Kerala prefer to search by their own, and in University of Kerala cent percent of Professors prefer to search electronic sources on their own.

4.4.15.4.2 Searching methods to get maximum recall form electronic sources Vs Research scholars

		Category - Researchers	To get maximum recall from electronic sources you prefer searching			Total
			Self	By library staff	Search together	
University	CUSAT	Ph.D	113 (76.4%)	5 (3.4%)	30 (20.3%)	148 (100%)
		M.Phil	10 (62.5%)	1 (6.2%)	5 (31.3%)	16 (100%)
		Total	123 (75.0%)	6 (3.7%)	35 (21.3%)	164 (100%)
	University of Kerala	Ph.D	84 (74.3%)	3 (2.7%)	26 (23.0%)	113 (100%)
		M.Phil	30 (47.6%)	7 (11.1%)	26 (41.3%)	63 (100%)
		Total	114 (64.8%)	10 (5.7%)	52 (29.5%)	176 (100%)

In both the universities, more number of Ph.D scholars seeks information from electronic sources by their own when compared to M.Phil scholars.

4.4.16 Reasons for preferring online services



Graph 4.4.16 Reasons for preferring online services

The reason for preferring online services was studied and is presented in the graph 4.4.16. From graph it is clear that the main reason for preferring online services is economy of time and a similar trend is seen in both the universities. Savolainen (Savolainen, 1999) also provides a similar view.

Table 4.4.16 Relationship of the reason for preferring online resources with academician's characteristics

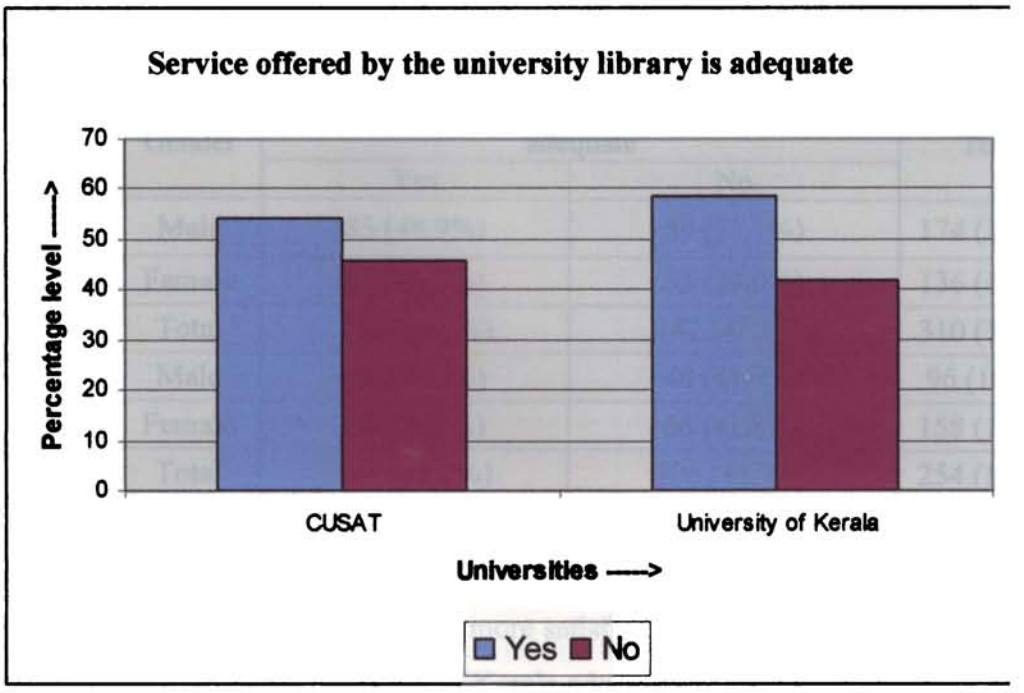
Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	98.352	6.025	2	.049
Age group	97.316	4.989	4	.288
Gender	96.810	4.483	2	.106
Qualification(s)	95.291	2.964	6	.813
Discipline	93.170	.843	2	.656
Category	92.888	.561	2	.755

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

Logistic regression was used to test whether exists any relation between the depe variable and user characteristics and is presented in the table 4.4.16. From table clear that university has an impact on the dependent variable.

4.4.17 Adequacy of service provided by the university library



Graph 4.4.17 Adequacy of service provided by the university library

The adequacy of the services offered by the university library is analysed a graphically presented in the graph 4.4.17. From graph it is clear that majority o users of both the universities are satisfied with the service provided by their library academics of University of Kerala are more satisfied with the services.

Table 4.4.17.1 Adequacy of service provided by the university library Vs Age

		Age group (Years)	Service provided by university library is adequate		Tot
			Yes	No	
University	CUSAT	Below 30	99 (54.1%)	84 (45.9%)	183 (1
		31- 45	39 (47.6%)	43 (52.4%)	82 (1(
		46 and above	30 (66.7%)	15 (33.3%)	45 (1(
		Total	168 (54.2%)	142 (45.8%)	310 (1
	University of Kerala	Below 30	121 (60.5%)	79 (39.5%)	200 (1
		31- 45	21 (55.3%)	17 (44.7%)	38 (1(
		46 and above	6 (37.5%)	10 (62.5%)	16 (1(
		Total	148 (58.3%)	106 (41.7%)	254 (1

Table 4.4.17.1 shows that, in CUSAT academics having age limit 46 and above, and in University of Kerala academics having age limit below 30 are the most contented group with the services provided by the university library.

Table 4.4.17.2 Adequacy of service provided by the university library Vs Gender

		Gender	Service provided by university library is adequate		Total
			Yes	No	
University	CUSAT	Male	85 (48.9%)	89 (51.1%)	174 (100%)
		Female	83 (61.0%)	53 (39.0%)	136 (100%)
		Total	168 (54.2%)	142 (45.8%)	310 (100%)
	University of Kerala	Male	56 (58.3%)	40 (41.7%)	96 (100%)
		Female	92 (58.2%)	66 (41.8%)	158 (100%)
		Total	148 (58.3%)	106 (41.7%)	254 (100%)

Gender wise analysis is presented in the table 4.4.17.2. From table it is evident that in CUSAT, female academics (61.0%) are more satisfied with the present service offered by the library, where as in University of Kerala adequacy of the present services of the library are almost on par between male and female academics.

Table 4.4.17.3 Adequacy of service provided by the university library Vs Discipline

		Discipline	Service provided by university library is adequate		Total
			Yes	No	
University	CUSAT	Science	104 (54.7%)	86 (45.3%)	190 (100%)
		Technology	64 (53.3%)	56 (46.7%)	120 (100%)
		Total	168 (54.2%)	142 (45.8%)	310 (100%)
	University of Kerala	Science	109 (57.4%)	81 (42.6%)	190 (100%)
		Technology	39 (60.9%)	25 (39.1%)	64 (100%)
		Total	148 (58.3%)	106 (41.7%)	254 (100%)

Discipline wise opinion on the adequacy of the services of the library is examined and is presented in the table 4.4.17.3. Table reveals that in CUSAT academics belonging to science faculty and in University of Kerala academics of technology faculty is more satisfied with the present services of the library.

4.4.17.4 Adequacy of service provided by the university library Vs Category

Table 4.4.17.4.1 Adequacy of service provided by the university library Vs Teachers

		Category-Teachers	Service provided by university library is adequate		Total
			Yes	No	
University	CUSAT	Lecturer	40 (57.1%)	30 (42.9%)	70 (100%)
		Reader	16 (55.2%)	13 (44.8%)	29 (100%)
		Professor	11 (52.4%)	10 (47.6%)	21 (100%)
		Total	67 (55.8%)	53 (44.2%)	120 (100%)
	University of Kerala	Lecturer	18 (46.2%)	21 (53.8%)	39 (100%)
		Reader	5 (45.5%)	6 (54.5%)	11 (100%)
		Professor	2 (40.0%)	3 (60.0%)	5 (100%)
		Total	25 (45.5%)	30 (54.5%)	55 (100%)

Table 4.4.17.4.1 provides teachers opinion on the adequacy of services provided by the university library. From table we can infer that majority of teachers of CUSAT are satisfied with the services offered by the library, while the teachers of University of Kerala are not satisfied with the services of the library.

Table 4.4.17.4.2 Adequacy of service provided by the university library Vs Research scholars

		Category-Researchers	Service provided by University library is adequate		Total
			Yes	No	
University	CUSAT	Ph.D	84 (50.6%)	82 (49.4%)	166 (100%)
		M.Phil	17 (70.8%)	7 (29.2%)	24 (100%)
		Total	101 (53.2%)	89 (46.8%)	190 (100%)
	University of Kerala	Ph.D	69 (56.6%)	53 (43.4%)	122 (100%)
		M.Phil	54 (70.1%)	23 (29.9%)	77 (100%)
		Total	123 (61.8%)	76 (38.2%)	199 (100%)

Research scholars' view on the adequacy of services provided by the university library is studied and is presented in the table 4.4.17.4.2. Research scholar wise analysis

shows that M.Phil scholars of both the universities are more satisfied with the present services offered by their respective libraries.

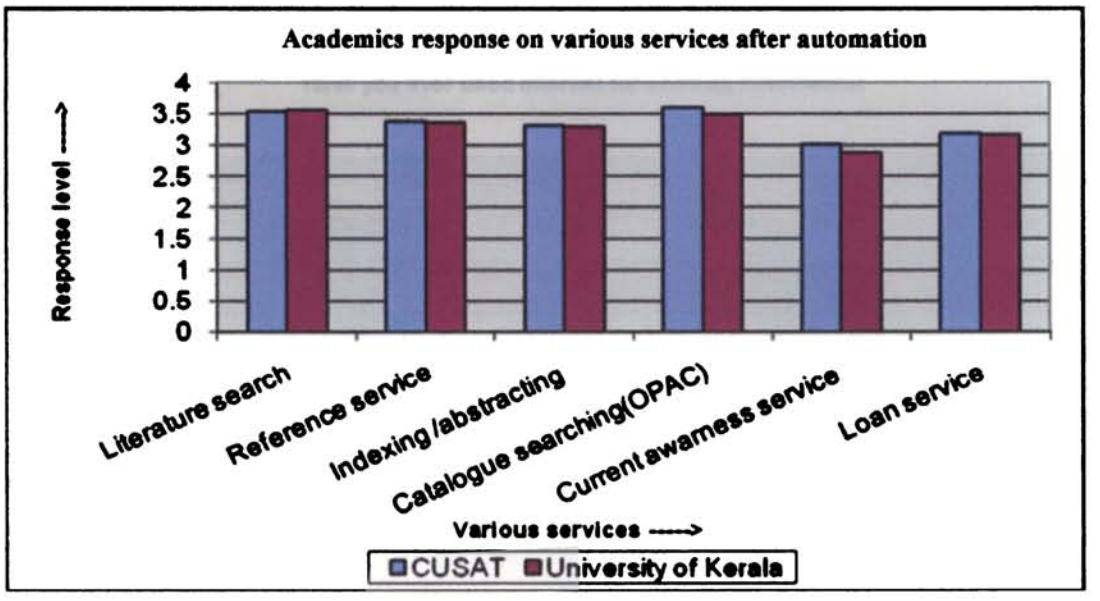
Table 4.4.17 Relationship of the adequacy of the services of the library with academics characteristics

Variables	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
University	278.252	.183	1	.669
Age Group	280.501	2.432	2	.296
Gender	279.570	1.501	1	.221
Qualification	283.235	5.166	4	.271
Category	291.310	13.241	4	.010
Discipline	278.595	.526	1	.468

a This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

The adequacy of the services provided by the university library was statistically analysed using nominal regression and is presented in the table 4.4.17. From table it is evident that category have an effect on the services provided by the respective university libraries.

4.4.18 Academics response on various services after automation



Graph 4.4.18 Academics response on various services after automation

A comparative study of the academics response on various services offered by the university library after automation is studied and is presented here in the graph 4.4.18. Services which have got a preference value of 2.5 or more are well rated, and here from the graph it is evident that all the services have got a preference value of more than 2.5, which means that the automation in the libraries is well accepted by the academics.

Table 4.4.18 Relationship of academics response on various services after automation with their characteristics

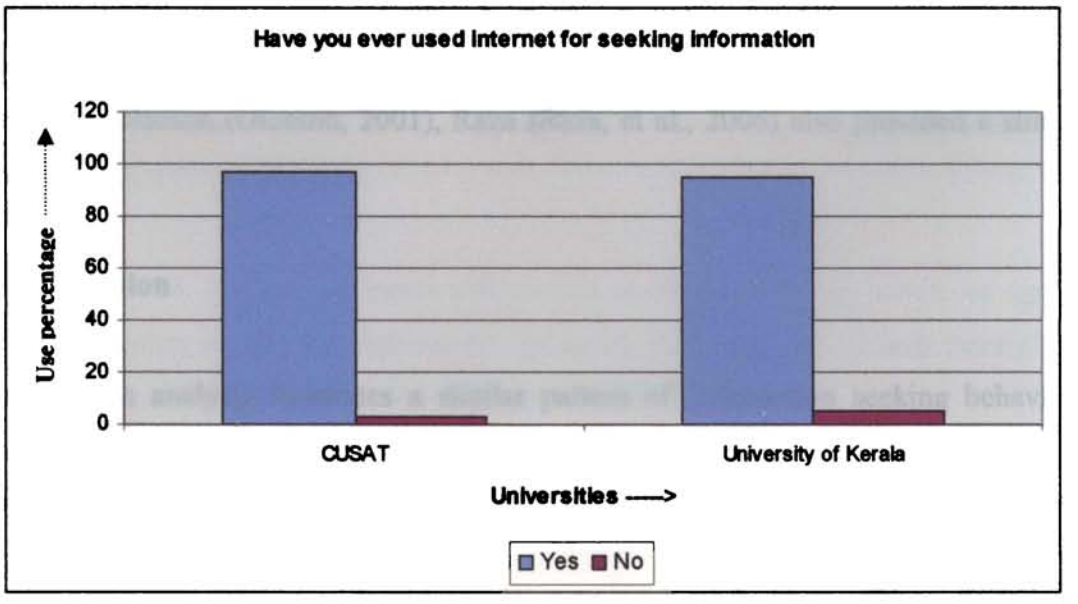
Variables	Type III Sum of Squares	df	Mean Square	F	Sig.
Institution	.062	1	.062	.076	.783
Category	.298	4	.074	.091	.985
Age Group	.023	2	.012	.014	.986
Gender	.001	1	.001	.001	.979
Qualification	4.119	4	1.030	1.256	.286
Discipline	.308	1	.308	.376	.540

a R Squared = .019 (Adjusted R Squared = -.004)

ANOVA was used to test the significance of the dependent variable with the respondent's characteristics and is presented in the table 4.4.18. From table it is evident that the dependent variable has no impact on the various automated services of the libraries.

4.4.19 Academics' usage and preference on various electronic sources

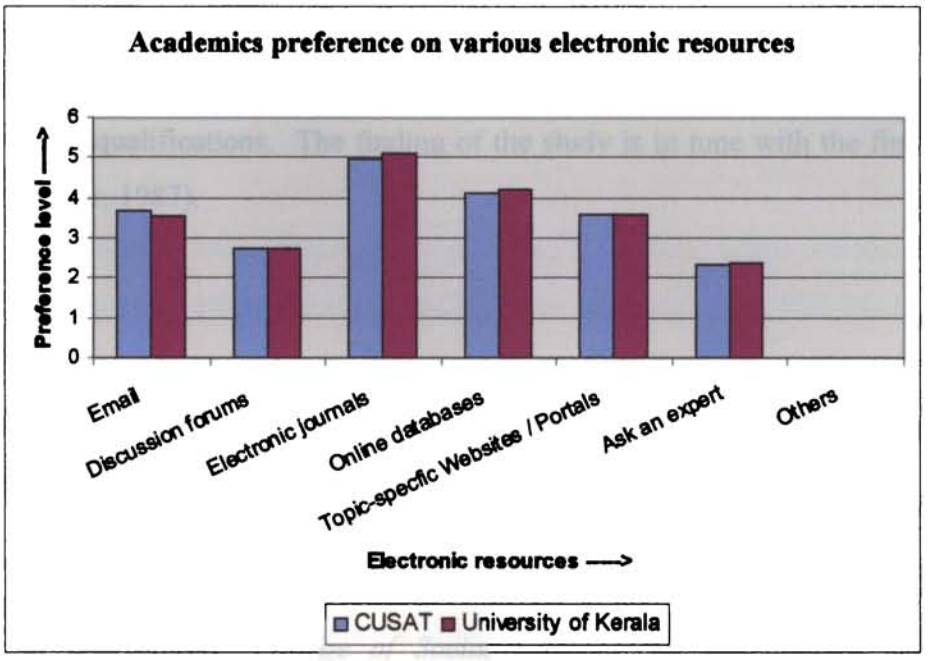
4.4.19.A Have you ever used internet for seeking information



Graph 4.4.19.A Have you ever used internet for seeking information

Graph 4.4.19.A provides a picture of academics internet use for gathering information. From graph it is evident that academics are relying heavily on internet for seeking information.

4.4.19.B Academics preference on various electronic sources



Graph 4.4.19.B Academics preference on various electronic sources

A comparative analysis of the academic's preference on various electronic resources is depicted in the graph 4.4.19.B. From graph it is obvious that the electronic journals are the most preferred electronic resource, followed by online databases. Here any source which has got a preference level of 3.5 or more can be considered as a preferred resource. Gleeson (Gleeson, 2001), Raza (Raza, et al., 2006) also provided a similar findings.

4.5 Conclusion

Comparative analysis illustrates a similar pattern of information seeking behaviour among the academics of both the Universities. Mendes (Mendes, et al., 1997), Kerins (Kerins, et al., 2004) provides a similar view.

Study showed that ICT had an impact on the ISB of the academics. Munjoo-Munshi (Munjoo-Munshi, et al., 1997), Hiller (Hiller, 2002) also endorse the findings. Ellis (Ellis, et al., 2005) is of the opinion that electronic medium has an impact on academics.

Study also demonstrates that almost all aspects of the ISB have significance with one or more of the various user characteristics namely age, category, discipline, gender, institution and qualifications. The finding of the study is in tune with the findings of Sridhar (Sridhar, 1987).

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CHAPTER 5

SUMMARY OF THE FINDINGS, RECOMMENDATIONS AND CONCLUSION

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5.0 Introduction

The study was carried out with the objective to determine the ISB and also to compare the ISB of the academics of CUSAT and University of Kerala. This chapter provides summary of the major findings of the study, tenability of the hypotheses, suggestions of the users, recommendations of the study and areas for further research.

5.1 Hypothesis testing

The following are the hypotheses of the study:

H1 ISB of an individual is influenced by personal factors.

H2. The pattern of the ISB of science and technology academics of the universities is similar.

H3. In this ICT era, there is a shift towards e-seeking.

H4. Productivity of academics is associated with their ISB.

H5. Users are satisfied with the existing sources of the library.

H6. Users are satisfied with the services offered by the library.

Several statistical techniques were used to check the validity of the hypotheses and are presented below.

5.1.1 ISB of an individual is influenced by personal factors

Various statistical techniques like ANOVA, nominal regression and logistic regression were used to test this hypothesis.

Since ISB cannot be estimated through a single question, different questions were framed to collaborate and to extract the concept. Each of these questions was statistically tested with different user characteristics and is presented in tables 4.1.7.1, 4.2.4, 4.3.1 to 4.3.6, 4.3.7.3, 4.3.7.4, 4.3.7.5, 4.3.8 to 4.3.11, 4.3.12.1, 4.3.13 to 4.3.15,

4.4.1.A, 4.4.1.B, 4.4.2, 4.4.3, 4.4.4, 4.4.7, 4.4.8.1, 4.4.8.2, 4.4.8.3, 4.4.8.4, 4.4.8.5, 4.4.11.A, 4.4.11.B, 4.4.14, 4.4.16 and 4.4.17.

From the inferences drawn from the above tables, it is clear that ISB of the academics is influenced by either all or some of the personal characteristics.

Hence H1 is valid.

5.1.2 The pattern of the ISB of science and technology academics of the Universities is similar

ISB of the academics of the universities is compared graphically. Graphs (4.2.4, 4.3.1, 4.3.2, 4.3.3, 4.3.5, 4.3.7.1, 4.3.7.2, 4.3.7.3, 4.3.7.4, 4.3.7.5, 4.3.11, 4.3.12.1, 4.3.13, 4.3.15, 4.4.1.A, 4.4.2, 4.4.3, 4.4.4, 4.4.5, 4.4.8, 4.4.9, 4.4.10, 4.4.10.B and 4.4.11.B) shows similarity in the pattern of ISB of the academics of both the universities.

Hence H2 is valid.

5.1.3 In this ICT era, there is a shift towards e-seeking

The influence of technology on the usage of the sources and services of both the universities were tested and is presented in the graphs 4.3.1 and 4.4.3. From the inference drawn from both the graphs it is clear that ICT has an effect on the ISB of the academics. Graph 4.3.11 also provides a similar view. Graph 4.4.19.A shows that almost all the academics of both the universities are using internet for seeking information. Further, graph 4.3.15 checks whether there is any shift towards e-seeking.

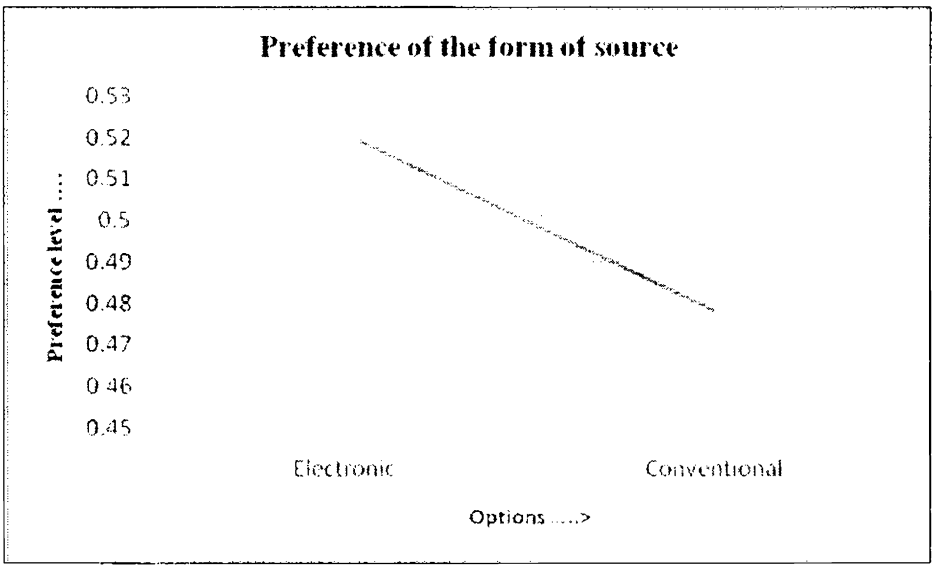
5.1.3.1 Preference of the source

Table 5.1.3.1 Preference of the source

	Frequency	Proportion	p-value
Electronic	494	0.521097	0.033086
Conventional	454	0.478903	

Testing for proportion was used to ascertain whether there is any shift in the form of source preferred by the academics in seeking information. Here the statistical null

hypothesis is that the proportion in favouring electronic source is 0.5 (ie 50%), and alternative hypothesis is proportion is greater than 0.5.



Graph 5.1.3.1 Preference of the source

A graph is plotted with the calculated values and from the graph we can observe a shift towards electronic source. Since p-value calculated is less than 0.05, it can be confirmed that academics are inclined towards e-seeking.

Hence the hypothesis H3 is valid.

5.1.4 Productivity of academics is associated with their ISB

The hypothesis is tested statistically with univariate analysis of variance by taking into account the productivity of the academics with the various facets of ISB and is presented below in tables 5.1.4.1 to 5.1.4.10.

Table 5.1.4.1 Information sought during different stages of research Vs Productivity

Statistical tests were employed to verify whether there exists any significance between the productivity of academics and the type of information sought during different stages of their research and is presented below in the table 5.1.4.1.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Current	34.325	3	11.442	81.540	.000
Retrospective	34.407	3	11.469	81.945	.000
Bibliographical	20.209	3	6.736	48.005	.000
Statistical	12.253	3	4.084	28.117	.000
Methodological	19.571	3	6.524	44.694	.000

Here, from the above table we can see that in all the types of information sought during different stages of research, have got a p-value of less than 0.0001, which is a lesser value than 0.05. Hence, we can infer that the type of information sought on various stages of research has significance with the productivity of academics.

Table 5.1.4.2 Retrospective literature search Vs Productivity

Retrospective literature search was statistically tested for its significance with productivity of academics and is presented below.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Scanning primary sources	34.572	6	5.762	40.840	.000
Citation from other works	24.575	5	4.915	35.701	.000
With the help of abstracting and indexing periodicals	8.563	5	1.713	13.447	.000
Using current contents	1.799	2	.899	9.874	.001

Table 5.1.4.2 shows that all the possibilities of retrospective literature search have got a p-value less than 0.001, which is a lesser value than 0.05. This implies that retrospective literature search of the academics have an impact on their productivity.

Table 5.1.4.3 Managing current information Vs Productivity

Current information sought by the academicians was tested in relation with their productivity and is tabulated here.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Book reviews in newspaper and professional periodicals	24.341	8	3.043	19.494	.000
Book trade catalogue and announcement bulletins	17.638	8	2.205	14.657	.000
Current periodicals	24.705	6	4.117	26.992	.000
New additions in the library	18.152	7	2.593	16.685	.000
Indexing and abstracting periodicals	17.555	8	2.194	14.925	.000
Seminars / Workshops / Conferences	23.962	7	3.423	23.121	.000
Informal communication channels	17.954	8	2.244	16.517	.000
Others	5.561	6	.927	5.449	.003

Table 5.1.4.3 shows that all the possibilities of managing current information have got a p-value less than 0.003, which is a lesser value than 0.05. Hence we can infer that the current information sought by the academics have an effect on the productivity of the academics.

Table 5.1.4.4 Participation in user discussion group in your area of interest through internet Vs Productivity

The influence of the user discussion forums with the productivity of the academics was tested and is presented in the table 5.1.4.4.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Model	31.666(a)	2	15.833	105.314	.000
Do you participate in user discussion group in your area of interest through internet	31.666	2	15.833	105.314	.000
Error	29.617	197	.150		
Total	61.283	199			

Since p-value calculated is less than 0.05, table 5.1.4.4 confirms that the participation on the user discussion groups by the academics have an effect on their productivity.

5.1.4.5 Channels of communication Vs Productivity

The influence of both formal and informal channels of communication, with the productivity of the academicians was verified statistically and is presented in the tables 5.1.4.5.1 and 5.1.4.5.2.

Table 5.1.4.5.1 Formal channels of communication Vs Productivity

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Conference papers	34.187	5	6.837	48.096	.000
Journal articles	34.171	5	6.834	48.050	.000
Preprints	34.171	6	5.695	39.866	.000
Research reports	34.158	5	6.832	48.012	.000
Electronic sources	34.180	5	6.836	48.075	.000

Table 5.1.4.5.2 Informal channels of communication Vs Productivity

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Inter personal communication	33.750	4	8.438	58.818	.000
Personal letters	33.924	4	8.481	59.436	.000
Telephone conversations	34.216	4	8.554	60.491	.000
Others	34.117	4	8.529	60.130	.000

In table 5.1.4.5.1 and table 5.1.4.5.2 the calculated p-value is less than 0.05, which infers that the both channels of communications have an impact on the productivity of the academics.

Table 5.1.4.6 Contacts with individuals in different establishment in different institutions Vs Productivity

Academics' contacts with individuals in different establishments for information were tested statistically with their productivity and are presented in the table 5.1.4.6.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Model	34.547(a)	2	17.274	124.503	.000
Have contacts with individuals in different establishment in different institutions	34.547	2	17.274	124.503	.000
Error	31.910	230	.139		
Total	66.458	232			

Here also the calculated p-value is less than 0.05, which means that academics contacts with individuals in other institutions for information have an influence on their productivity.

Table 5.1.4.7 The form of source preferred by the academicians Vs Productivity

The influence of the form of source preferred by the academics was statistically tested with their productivity and is presented in the table 5.1.4.7.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Model	34.010(a)	3	11.337	80.007	.000
The form of source preferred by the academicians	34.010	3	11.337	80.007	.000
Error	32.448	229	.142		
Total	66.458	232			

Since the calculated p-value is less than 0.05, we can infer that the form of source have an influence on the productivity of the academicians.

5.1.4.8 Library use

Library use of the academicians was tested statistically for any effect on their productivity and is presented in the tables 5.1.4.8.1 and 5.1.4.8.2.

Table 5.1.4.8.1 University library use Vs Productivity

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Model	34.419(a)	6	5.737	40.466	.000
How often do you use - University library	34.419	6	5.737	40.466	.000
Error	32.038	226	.142		
Total	66.458	232			

Table 5.1.4.8.2 Department library use Vs Productivity

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Model	33.836(a)	6	5.639	39.068	.000
How often do you use - Department library	33.836	6	5.639	39.068	.000
Error	32.622	226	.144		
Total	66.458	232			

Here in both the tables the p-value calculated is less than 0.05, which means that academics' library use have an effect on their productivity.

Table 5.1.4.9 Purpose for using the library Vs Productivity

Statistical methods were employed to check whether there exists any effect, between the purpose of using the library and the productivity of the academics, and are presented in the table 5.1.4.9.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
To keep abreast with current literature	34.477	6	5.746	40.607	.000
To write papers / develop presentation	34.715	6	5.786	41.193	.000
For guiding researchers	33.995	6	5.666	39.445	.000
For preparation of teaching	34.190	6	5.698	39.912	.000
Reference	34.695	6	5.782	41.143	.000
Others	34.409	6	5.735	40.440	.000

From table 5.1.4.9 it is clear that all the possibilities of the purpose have got a p-value less than 0.05, which infers that purpose of using the library have an effect on their productivity.

Table 5.1.4.10 While retrieving information through electronic sources who formulate strategy Vs Productivity

The delegation of work among academicians in seeking information through electronic sources was tested for any effect on their productivity and is presented in the table 5.1.4.10.

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Model	31.589(a)	3	10.530	73.214	.000
While retrieving information through electronic sources who formulate strategy	31.589	3	10.530	73.214	.000
Error	29.340	204	.144		
Total	60.929	207			

Since the p-value calculated is less than 0.05, we can infer that, delegation of work during information search through electronic sources has an impact on their productivity.

From the inferences drawn from the above tables (5.1.4.1 to 5.1.4.10), we can infer that the productivity of the academics is associated with their ISB.

Hence H4 is valid.

5.1.5 Users are satisfied with the existing sources of the library

Testing for proportion was used to ascertain the satisfaction of the users on the sources provided by the library. Here the statistical null hypothesis is, proportion in favour of satisfied users is 0.5 (ie 50%) and the alternative hypothesis is proportion is greater than 0.5.

Table 5.1.5 Users are satisfied with the existing sources of the library

Source	Cases	Proportion	p-value
Satisfied	267	0.473404	0.994444
Dissatisfied	297	0.526596	

Since the p-value calculated is greater than 0.5, the statistical null hypothesis is accepted, which implies that majority of the users are not satisfied with the existing sources of the library.

Hence H5 is rejected

5.1.6 Users are satisfied with the services offered by the library

Testing for proportion was used to ascertain the satisfaction of users on the services offered to them by the library. Here the statistical null hypothesis is, proportion in favour of satisfied users is 0.5 (ie 50%) and the alternative hypothesis is proportion is greater than 0.5.

Table 5.1.6 Users are satisfied with the services offered by the library

Service	Cases	Proportion	p-value
Satisfied	316	0.560284	0.00001
Dissatisfied	248	0.439716	

Since the p-value calculated is less than 0.5, the statistical null hypothesis is rejected, which implies that majority of the users is satisfied with the services of the library.

Hence H6 is valid.

5.2 Summary of findings

Based on the analysis of the data collected, the following conclusions were drawn:

a) ISB of the academics is associated with all or some of their personal characteristics.

b) Information seeking pattern of the science and technology academics of both the universities is similar.

c) Productivity of the academics is associated with their ISB.

d) Study reveals that academicians depend on library at each and every stages of their research, and they use library for fulfilling their academic needs.

e) Internet is the main source of information for the academics of both the universities.

f) Users are aware of the facilities in the university; a comparative investigation of the awareness of traditional services and electronic services reveals that users are well aware of the electronic services.

g) Study shows a trend towards electronic seeking.

h) Department library system is consulted more often than university library system.

i) Investigation on the adequacy of each and every source of the libraries reveals that the sources are adequate. Among different sources, academics feel that text book and reference collection are very much adequate. The journal collection and electronic collection is also adequate but not as adequate as text books and reference collections. As a whole academics of CUSAT consider that sources at the university are not adequate, but academics of University of Kerala think that sources at the university are adequate. Most of the academics consulted other libraries also. This is due to the lack of resources in the library.

j) The navigation strategies adopted by the academicians on various sources like textbooks, journals, reference sources, abstracts and online full text sources were analysed. It is found that in almost all the cases they prefer to search by subject.

k) A good number of the academicians consulted non-book materials for their information needs.

l) Academicians use both formal as well as informal means of communication for their information requirements.

m) Academicians have contacts between individuals in different establishments for information.

n) Majority of the academics are not conscious about the abstracting journals.

o) Majority of the users are aware of the user awareness programmes, but these awareness programmes have little impact on the user community as they acquire knowledge in using the electronic resources through experience.

p) Study shows that academics are aware of the services offered by different agencies.

q) Only very few academics of the universities make use of languages other than English for information gathering.

r) Teachers use foreign databases for seeking information and they prefer to search by their own. Study reveals that as far as faculty members are concerned, the tendency to use online search of foreign databases increases with experience. Comparative analysis shows that more academics of CUSAT (66%) prefer to formulate search strategy by their own, than academics of University of Kerala (52.2%).

s) Study reveals that the main reason for preferring online services is economy of time and a similar trend is seen in both the universities.

t) Academics of the universities choose Current Science and Nature as the most preferred journals.

u) The most preferred website for the academicians of the universities is science direct.

5.3 Suggestions of the respondents

5.3.1 CUSAT

The suggestions and comments for the improvement of the library collection and services of CUSAT were elicited from the academics through an open ended question, which was the last question in the questionnaire. 67% academics expressed their views. The views are presented here in the descending order of their demand.

a) A good majority of the respondents had requested for more online collection especially online journals.
b) Majority of the academics, irrespective of the disciplines, demand science direct.
c) Many of them requested for user awareness programmes.
d) Academics are of the opinion that the working hours of the department library should be increased.
e) Academics feel that the text book collection is to be periodically updated with latest editions.
f) They had requested for regular updating of information on OPAC.
g) Academics demand more facilities like clean environment, print out facilities etc.
h) Some of them had requested for journals with high impact factor.

5.3.2 University of Kerala

Last question of the questionnaire was an open ended one, which was meant for extracting the opinions from the respondents for improving the library resources and services. 61% of the respondents expressed their views. The significant suggestions made by the academics are listed here on the descending order of their demand.

a) Academics are of the opinion that more number of online journals and related facilities should be made available.
b) Academics feel that user awareness programme to be conducted regularly.

c) They had requested to update the present collection of books with latest editions.
d) They feel that the working hours of the library, especially the department libraries, to be increased.
e) Automation of department libraries should be carried out.

5.4 Suggestions and recommendations of the study

Keeping in view of the findings of the study and the suggestions of the respondents, the investigator proposes the following schema of actions to stream line the library sources and services in tune with user demands.

a) Periodic comprehensive user study should be conducted and the findings of the study should form the basis of collection development and also in the development of the information system.

b) Since the users prefer to have electronic sources, authorities should think of strengthening the electronic resources of the library, both in its form as well as in number.

c) A good number of respondents had requested for more online journals and they think that online science direct subscription is very essential, hence the university can think of subscribing to science direct.

d) It is high time for libraries to reach to their users. Technology oriented user orientation system should be launched by the library so that the users at their own convenience will get a chance to be informed about each and every service and resource of the library.

e) Libraries, especially department libraries, are consulted more often and hence steps should be taken to strengthen the department library system by automating the libraries and also by increasing the library hours.

f) In order to enhance the library use, library oriented study should be encouraged.

5.5 Conclusion

The objectives of the study are substantiated based on the findings arrived at chapter four. Study shows that ICT has an impact on the ISB of the academics and users are inclined towards electronic resources and services. Hence the libraries should give more importance to building the electronic collection and facilities in accordance with user expectation.

5.6 Areas for further research

ISB studies have got such an immense potential that such study should be carried out periodically for the benefit of the users. Investigator feels that a range of studies can be conducted in the area of ISB of academicians and are listed below.

a) Studies can be conducted to investigate the ISB of faculty members and research scholars in all the universities in Kerala.

b) The effect of information deluge especially due to the increasing electronic information and its variant forms on the ISB of the users can be studied.

c) A comparative study of the ISB of the faculty members of CUSAT with faculties in the institutes of national importance like IISc Bangalore or with any of the IITs can be undertaken.

d) The use pattern of the students of the universities of Kerala can be estimated

e) ISB models are a less researched area and further studies can be carried out in this field.

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APPENDIX 1

QUESTIONNAIRE

Title of the research is "A study of the information seeking behaviour of science and technology teachers and researchers of Cochin University of Science and Technology and University of Kerala in the changed library environment".

Research Scholar : Shibu Ray. S, Asst. Librarian, CUSAT Supervising Guide: Dr. (Mrs.) M.D Baby

Please respond to each question by putting a tick mark or by giving your valuable opinions

I. PERSONAL INFORMATION

1. Name :
2. Age group : up to 30 yrs ☐ 31- 45 yrs ☐ 46 yrs and above ☐
3. Gender : Male ☐ Female ☐
4. Qualification (s)
5. Designation & Department
6. Category : **Teachers** **Researchers**
   - Lecturer ☐ Ph.D ☐
   - Reader ☐ M.Phil ☐
   - Professor ☐
7. Do you have published work : Yes ☐ No ☐, *if yes,*
   a) Total number of papers/articles published ☐
   b) No. of books published/coauthored/edited... ☐
   c) No of papers / articles published in
      - i) International level journals ☐
      - ii) National level journals ☐
      - iii) Regional level journals ☐
      - iv) Seminars / Conferences etc. ☐
      - v) Others (please specify) ☐ .....

II. STAGES OF RESEARCH

1. What is the present stage of your research work? Completed ☐ Ongoing ☐

(*if completed very early, skip this section and continue from part* III of the questionnaire ie "source of information and means of communication")

a) Selection of topic ☐
b) Literature search ☐
c) Data collection ☐
d) Analysis ☐
e) Writing thesis ☐
f) Others (please specify) ☐ .....

2. How many hours per week do you spent for your research work in the following places?

Place	Hours
a) University library	☐
b) Department library	☐
c) Home	☐
d) Laboratory	☐
e) Other library (please specify)	☐ .....

3. Do you feel any difficulty in conducting literature search in connection with your research work?

Yes ☐ No ☐; ***if yes*** briefly please summarise your difficulty

4. Rank the stage of your work where you have depended more on library: (1, 2, 3, 4... ; ***Highest rank is*** 1)

a) Selection of topic ☐
b) Literature search ☐
c) Analysis ☐
d) Writing thesis ☐
e) Others (please specify) ..... ☐

5. What type of information you sought for your research work during different stages:

	Type of information	**Literature search**	**Analysis**	**Writing thesis**
a)	Current	☐	☐	☐
b)	Retrospective	☐	☐	☐
c)	Bibliographical	☐	☐	☐
d)	Statistical	☐	☐	☐
e)	Methodological	☐	☐	☐
f)	Others (please specify)	☐	☐	☐

III. SOURCE OF INFORMATION AND MEANS OF COMMUNICATION

1. What are the different types of information sources required to meet your information needs (**Kindly rank** 1,2,3, 4... according to your preference)

a) Text books ☐
b) Conference / Seminar proceedings ☐
c) Dissertations / Thesis ☐
d) Patents ☐
e) Standards ☐
f) Journal / Periodicals ☐
g) Technical reports ☐
h) Information from Internet ☐
i) Formal sources (Attending seminars, conferences, workshops etc..) ☐
j) Informal sources (Teachers, discussions with colleague, personal letters, telephonic conversations ...) ☐
k) Any other sources (please specify) ..... ☐

2. Which area of the collection in your university library do you think not adequate?

		Adequate	**Partially**	**Inadequate**	**Don't Know**
a)	Text books	☐	☐	☐	☐
b)	Reference books	☐	☐	☐	☐
c)	Journals / Periodicals	☐	☐	☐	☐
d)	Abstracting / indexing periodicals	☐	☐	☐	☐
e)	Research publications	☐	☐	☐	☐
f)	Bibliographies	☐	☐	☐	☐
g)	Electronic collection	☐	☐	☐	☐
h)	Non book materials	☐	☐	☐	☐

3. Please indicate the frequency of your use of various sources:

		Frequently	Occasionally	Rarely	Never
a)	Text books	☐	☐	☐	☐
b)	Reference books	☐	☐	☐	☐
c)	Journals / Periodicals	☐	☐	☐	☐
d)	Abstracting / indexing periodicals	☐	☐	☐	☐
e)	Patents / Standards	☐	☐	☐	☐
f)	E-books	☐	☐	☐	☐
g)	Electronic journals	☐	☐	☐	☐
h)	Online / CD ROM databases	☐	☐	☐	☐
i)	Non-book materials	☐	☐	☐	☐
j)	Technical reports	☐	☐	☐	☐
k)	Conference papers	☐	☐	☐	☐
l)	Dissertation / Thesis	☐	☐	☐	☐
m)	Catalogue and bibliographies	☐	☐	☐	☐

4. How many scholarly journals in your subject of interest do you read regularly?

0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ more than 5 ☐

5. Please write the titles of at least **3 journals** that you wish to read essentially from your library (list according to your preference)

a) .....

b) .....

c) .....

6. How do you conduct retrospective literature search ***(select more than one choice, if necessary)***

a) By scanning primary sources (periodicals, reports, thesis...) ☐
b) Citation form other works ☐
c) With the help of abstracting and indexing periodicals ☐
d) Using current contents ☐
e) Others (please specify) ..... ☐

7. How do you manage to know about the current information in your subject field (please show your preference by ranking 1, 2, 3, 4...)

a) Book reviews in newspaper and professional periodicals ☐
b) Book trade catalogue and announcement bulletins ☐
c) Current periodicals ☐
d) New additions in the library ☐
e) Indexing and abstracting periodicals ☐
f) Seminars / workshops / conferences ☐
g) Informal communication channels ☐
h) Others (please specify)..... ☐

8. Do you think that the source in your university library is adequate: Yes ☐ No ☐

if no, kindly suggest some sources

9. How do you perform information search from the following sources. please indicate your preference by ranking 1.2.3. 4... in each of the following

A. Books

a) Consulting the index ☐
b) Reading the content page ☐
c) Browsing the whole book ☐
d) Others (please specify)..... ☐

B. Journals

a) Reading the content page ☐
b) Browsing the whole journal ☐
c) Consulting the index pages ☐
d) Consulting the abstracting sources ☐
e) Go directly to the articles concerned ☐
f) Others (please specify) ..... ☐

C. Reference sources

a) Consulting subject index ☐
b) Through alphabetical listing ..... ☐

D. Abstracts

a) Consulting subject index ☐
b) Consulting author index ☐
c) Consulting keyword index ☐
d) Others (please specify)..... ☐

E. Online Full text sources

a) Consulting subject index ☐
b) Consulting author index ☐
c) Consulting title index ☐
d) Others (please specify)..... ☐

10. Have your ever-experienced non- availability of required document / article in the library during the preparation of teaching /seminar paper / research work etc? Yes ☐ No ☐

11. Do you participate in user discussion groups in your area of interest through INTERNET?
Yes ☐ No ☐

12. Have you consulted non-book materials for your information needs? Yes ☐ No ☐

13. What according to you. is the usual method for finding specific information on a topic (rank 1, 2. 3,4... according to your choice)

a) Consulting reference source ☐
b) Consulting library staff ☐
c) Searching the internet ☐
d) Consulting catalogue ☐
e) Others (please specify ☐ .....

14. Kindly rank the following channels of communication according to your preference (1,2,3,4...)

Formal		**Informal**	
a) Conference papers	☐	a) Inter personal communication	☐
b) Journal articles	☐	b) Personal letters	☐
c) Preprints	☐	c) Telephone conversations	☐
d) Research reports	☐	d) Others (please specify)	☐
e) Electronic sources	☐		
f) Others (please specify)	☐		

15. State the reasons for choosing informal channels in the order of your preference by ranking 1,2,3,4...

a) To meet the practical needs ☐
b) Peer group discussion ☐
c) To exchange ideas ☐
d) To establish potential contacts ☐
e) Others (please state) ..... ☐

16. Do you have contacts with individuals in different establishments in different institutions for exchange of information (invisible colleges): Yes ☐ No ☐

17. Among the following, which form of source you would prefer?

a) Electronic ☐ b) Print ☐ c) Both 'a' and 'b' ☐

IV. LIBRARY USE AND SERVICES

1. How often do you use,

A) University library?

a) Daily ☐ b) in 2-3 days ☐ c) Weekly ☐ d) Fortnightly ☐ e) Occasionally ☐ f) Never ☐

B) Department library

a) Daily ☐ b) in 2-3 days ☐ c) Weekly ☐ d) Fortnightly ☐ e) Occasionally ☐ f) Never ☐

C) Campus library **(applicable for academics of University of Kerala)**

a) Daily ☐ b) in 2-3 days ☐ c) Weekly ☐ d) Fortnightly ☐ e) Occasionally ☐ f) Never ☐

2. What is your purpose of using the library; rank 1,2,3, 4... etc. according to your preference:

a) To keep abreast with current literature ☐
b) To write paper / develop presentation ☐
c) For research purpose ☐
d) For guiding researchers ☐
e) For preparation of teaching ☐
f) Reference ☐
g) Others (please specify) ..... ☐

3. Some of the services provided by the University library is given below, have you utilized / aware of these service:

Services	Aware	Unaware	Utilised
a) Reference	☐	☐	☐
b) Bibliography	☐	☐	☐
c) Current awareness service	☐	☐	☐
d) Reprography	☐	☐	☐
e) Loan (Issue Return of Books)	☐	☐	☐
f) OPAC (Online Public Access Catalog)	☐	☐	☐
g) Literature search	☐	☐	☐
j) New additions	☐	☐	☐

4. Are you aware / utlised the special services offered by your university library?

Services	Aware	Unaware	Utilised
a) Electronic document delivery	☐	☐	☐
b) Online / CD ROM databases	☐	☐	☐
c) Electronic journals	☐	☐	☐
d) New additions in electronic form	☐	☐	☐
e) Conference alert	☐	☐	☐

5. How do you locate information from the library; Rank 1,2,3,4... etc according to your preference:

a) Using library catalogue / OPAC ☐
b) With the consultation library staff ☐
c) New addition alert ☐
d) Citation from other sources ☐
e) With the help of colleagues ☐
f) Searching shelves ☐
h) Others (please specify) ☐ .....

6. Are you aware of abstracting journals in your subject area: Yes ☐ No ☐ **if yes,**

A) How often you have consulted these sources

a) once in a week ☐ b) twice in a week ☐ c) once in a month ☐ d) sparingly ☐

7. Are you aware of the user awareness programmes conducted by your University library?

Yes ☐ No ☐

8. Are you aware / utlised the services provided by the following agencies?

Agencies	Aware	Unaware	Utilised
a) Patent information centre	☐	☐	☐
b) NISCAIR	☐	☐	☐
c) INFLIBNET	☐	☐	☐
d) DELNET	☐	☐	☐
e) Others (please specify)	☐	☐	☐

9. Do you make use of information / article from foreign languages other than English?

Yes ☐ No ☐

10. Do you seek information from libraries other than your university / department library?

Yes ☐ No ☐ ***if yes,***

a) Please state your reason for using other libraries
   i) Lack of resources in your library ☐
   ii) Staff not cordial ☐
   iii) Others (please specify) ..... ☐
b) How many libraries do you consult ☐

11. Do you know how to use the electronic resources in the university library? Yes ☐ No ☐

if yes, how do you acquire this knowledge?

a) By experience ☐
b) Through user awareness programmes of library ☐
c) Self-learning ☐
d) Learned from colleagues ☐
e) Others (please specify) ..... ☐

12. Have you done online search of foreign databases to get information regarding your Teaching / Research / Guidance Yes ☐ No ☐

13. Which type of database you frequently use
   a) Bibliographic ☐
   b) Full text ☐
   c) Both 'a' and 'b' ☐
   d) Others (please specify) ..... ☐

14. While retrieving information through electronic sources who formulate the search strategy
   a) Library staff ☐
   b) Self ☐
   c) Both 'a' and 'b' ☐
   d) Others (please specify) ..... ☐

15. According to you, to get maximum recall from electronic sources you prefer searching
   a) Self ☐
   b) By library staff ☐
   c) Searching together ☐
   d) By other means (please specify) ..... ☐

16. State the reason (s) for preferring online services ***(select more than one choice, if necessary)***
   a) Easy access ☐
   b) Economy of time ☐
   c) Accuracy of information ☐
   d) None of these (please specify) ..... ☐

17. Do you think that the service offered by your university library is adequate: Yes ☐ No ☐
   if no, kindly mention the services you expect:

.....

.....

18. How do you evaluate the services offered by your University library in the following areas, after automation?

	Services	**Poor**	**Average**	**Good**	**Excellent**	**Don't Know**
a)	Literature search	☐	☐	☐	☐	☐
b)	Reference service	☐	☐	☐	☐	☐
c)	Indexing / Abstracting	☐	☐	☐	☐	☐
d)	Catalogue searching (OPAC)	☐	☐	☐	☐	☐
e)	Current awareness service	☐	☐	☐	☐	☐
f)	Loan service	☐	☐	☐	☐	☐

19. Have you ever used Internet resources for seeking information: Yes ☐ No ☐ ***if yes,*** kindly rank (1 , 2, 3, 4 ...) the following electronic resources according to your preference
   a) Email ☐
   b) Discussion forums ☐
   c) Electronic journals ☐
   d) Online databases ☐
   e) Topic-specific Web sites / Portals ☐
   f) Ask an expert ☐
   g) Others (please specify) ☐ .....

20. Kindly list at least **three** topic-specific web sites you commonly use for upgrading your subject knowledge

a) .....

b) .....

c) .....

21. Explain briefly your suggestions for improving the library collection and services

THANK YOU for sparing your valuable time, and assure you that the data provided by you will be used for academic purpose only

APPENDIX 2

JOURNAL PREFERENCE OF ACADEMICS - DEPARTMENT WISE

Journals ranked by the academics in each subjects are listed below in the descending order of their preference. Journals which have got up to third rank are only listed here.

A2.1 CUSAT

A.2.1.1 Department wise ranked journals

Atmospheric Science

1. Journal of Atmospheric science
2. Journal of Climatology
3. International journal of Climatology

Biotechnology

1. Nature
1. Science
2. Biotechnology Letters
3. Journal of Microbiology

CELOS

1. Journal of Non-Crystalline Solids
2. Journal of optoelectronics
3. Physica status solidi

Chemical Oceanography

1. Marine Chemistry
2. Marine Pollution Bulletin
3. Indian Journal of Marine Science

Chemistry

1. Journal of the American Chemical Society
2. Journal of Organic Chemistry
3. Analytica Chemica Acta

Computer Application

1. ACM transactions
2. Journal of fluid mechanic
3. IEEE journals

Computer Science

1. ACM transactions
2. IEEE journals
3. Association for Computational Linguistics journal

Electronics

1. IEEE transactions on Antennas and Propagation
2. IEEE Electronic letters
3. IEEE Antenna and Wireless Propagation Letters

Engineering - Computer Science

1. ACM transactions
1. IEEE transactions
2. Artificial Intelligence
3. Journal of Applied Science

Engineering - Civil

1. Water Research
2. Water Science and Technolgy
3. Journal of Hydrology
3. Science Direct journals

Engineering - IT

1. IEEE transactions on Software Engineering
2. Elsevier journals
3. ACM transactions on Software Engineering

Engineering - Electronics

1. IEEE Antennas and Propagation
2. IEEE Electronic Letters
3. IEEE transactions on Medical Imaging

Engineering - Fire & Safety

1. Journal of Loss prevention in the Process Industries
2. Safety Science
3. Fire Safety journal

Engineering -Marine

1. Journal of Vibrations
2. Journal of the American Academy of Audiology
3. Heat and Mass Transfer

Engineering - Mechanical

1. IEEE proceedings on Mechanical engineering
2. International Journal of Production Research
3. Journal of tribiology

Engineering - Mathematics

1. Journal of Fuzzy Sets and Systems
2. Journal of Mathematical Analysis

Environmental Science

1. Applied Environmental Micro biology
2. Bulletin of Environmental Contamination and Toxicology
2. Current Science
2 Journal of Applied Microbiology
3. Journal of Applied Biotechnology
3. Nature

Industrial Fisheries

1. Journal of Food Science
2. Aquaculture
3. Economic and Political Weekly

Instrumentation

1. American Institute of Physics journals
2. Review of scientific instruments
3. Institute of Physics journals
3. Journal of Applied Physics

Marine Biology Micro Biology & Biochemistry

1. Aquaculture
2. Fish and Shellfish Immunology
3. Process Biotechnology

Marine Geology and Geophysics

1. Down to Earth
2. Journal of Geological Society of India
3. Nature

Mathematics

1. Journal of Applied Probability
2. Advances in Applied Probability
2. Indian Journal of Pure and Applied Physics
2. Journal of Fluid Mechanics
2. Journal of Fourier Analysis and its Applications
3. Opsearch

Photonics

1. Applied Optics
2. Physics Review Letters
3. Optical Engineering

Physical Oceanography

1. Boundary-Layer Meteorology
1. Estuarine, Coastal and Shelf Science
1. Current Science
2. Deep Sea Research
3. Journal of Coastal Research

Physics

1. Thin Solid Film
2. Journal of Applied Physics
3. Journal Magnetism and Magnetic Materials
3. Physics Review

Polymer Science and Rubber Technology

1. Journal of Applied Polymer Science
2. Rubber Chemistry and Technology
3. Polymer

Ship Technology

1. Naval Architect
2. International Shipbuilding Progress
3. Computers and Structures
3. International Journal of Numerical Methods in Engineering
3. Marine Technology
3. Transactions RINA

Statistics

1. Journal of American statistical association
2. American Statistician
3. Journal of Applied Probability

A.2.1.2 Preferred journals

The journals which are preferred by the academics of more than three departments are listed here along with the department names, and the journals are listed alphabetically.

ACM transactions

Computer Application, Computer Science, Engineering– Computer Science, Engineering-Electronics and Engineering- IT.

Analytical Biochemistry

Environmental Science, Industrial Fisheries and Marine Biology Micro Biology & Biochemistry.

Applied physics letters

Instrumentation, Photonics and Physics

Aquaculture

Environmental Science, Industrial Fisheries and Marine Biology Micro Biology & Biochemistry.

Current science

Atmospheric Science, Chemical Oceanography, Environmental science, Marine Biology Micro Biology & Biochemistry, Marine Geology and Geophysics, Physical Oceanography and Photonics

Elsevier Journals

Computer Science, Electronics, Physics and Engineering -IT

Indian journal of Marine Science

Chemical Oceanography, Environmental science and Marine Biology Micro Biology & Biochemistry.

Nature

Biotechnology, Chemistry, Environmental science, Industrial Fisheries, Marine Biology Micro Biology & Biochemistry, Marine Geology and Geophysics, Photonics, Physics and Polymer Science and Rubber Technology.

Science

Bio Technology, Environmental science, Marine Biology Micro Biology & Biochemistry and Photonics

A.2.1.3 Most preferred journals

In CUSAT, Current Science and Nature are the most preferred journals among the academics across different disciplines.

A.2.2 UNIVERSITY OF KERALA

A.2.2.1 Department wise ranked journals

Aquatic Biology & Fisheries

1. Current Science
2. Indian Journal of Marine Sciences
3. Indian Journal of Marine Biology

Biochemistry

1. Journal of Biological Chemistry
2. Nature
3. Journal of Cell Biology

Bio-Informatics

1. Nature
2. Science
3. In Silico Biology

Biotechnology

1. Biotechnology Letters
2. Nature Genetics
3. Enzyme and Microbial Technology

Botany

1. Current Science
2. Indian Journal of Experimental Biology
3. Plant Cell Tissue and Organ Culture

Chemistry

1. Indian Journal of Chemistry
2. Nature
3. Chemical Science
3. Thermochimica Acta
3. Journal of Inorganic Nuclear Chemistry

Computer Science

1. IEEE Image Processing
2. IEEE transactions on Signal Processing
3. Spectrum

Demography

1. Demography
2. Demography of India
3. A Journal of Family Welfare

Engineering- Civil

1. American Society of Civil Engineering journals
2. IEEE journals
3. IEEE Spectrum

Engineering- Computer Science

1. Information Technology
2. PC Quest
3. Week

Engineering - Electrical engineering

1. IEEE journals
2. Elsevier journals
3. Nature

Engineering - IT

1. PC Quest
2. Electronics for You

Engineering – Electronics

1. Electronics for You
2. India today
3. Outlook

Engineering – ECE

1. IEEE transactions on image processing
2. IEEE transactions on signal processing

Environmental Science

1. Current Science
2. Nature
3. Pollution Research

Future Studies

1. Discrete Mathematics
2. Discrete Applied Mathematics
3. Society of Industrial and Applied Mathematics journals

Geology

1. Journal of Geological Society of India
2. Current Science
3. Hydrology

Mathematics

1. IEEE Fuzzy Sets and Systems
2. Mathematics
3. Journal of Graph Theory

Optoelectronics

1. Information Technology
2. Journal of Non-destructive Testing and Evaluation
3. Applied Physics Letters
3. Thin Solid Films
3. Photonics Spectra

Physics

1. Journal of Geophysical Research
2. Journal of Atmospheric and Solar Terrestrial Physics
3. Nanotechnology

Statistics

1. BiometriKa
2. Journal of the Royal Statistical Society Series B
3. Metrika

Zoology

1. Nature
2. Current Science
3. Indian Journal of Experimental Biology

A.2.2.2 Preferred journals

The journals which are preferred by the academics of more than three departments are listed here along with the department names, and the journals are listed alphabetically.

Current Science

Aquatic Biology & Fisheries, Biochemistry, Botany, Environmental Science, Geology and Zoology

Nature

Biochemistry, Bio-Informatics, Botany, Chemistry, Engineering- Electrical Engineering, Environmental Science, Optoelectronics and Zoology

Science

Bio-Informatics, Optoelectronics and Zoology

A.2.2.3 Most preferred journals

Academicians of University of Kerala also choose Current Science and Nature as the most preferred journals.

APPENDIX 3

WEB SITES PREFERRED BY ACADEMICS OF VARIOUS DISCIPLINES

Topic specific websites ranked by the academics in each subjects are listed below in the descending order of their preference. Websites which have got up to third rank are only listed here.

A3.1 CUSAT

A.3.1.1 Department wise ranked websites

Atmospheric Science

1. http://www.springer.com
2. http://www.sciencedirect.com
3. http://www.google.co.in

Bio Technology

1. http://www.sciencedirect.com
2. http://www.pubmedcentral.nih.gov
3. http://www.google.co.in

Chemical Oceanography

1. http://www.springer.com
2. http://www.tandf.co.uk/journals
3. http://www3.interscience.wiley.com

Chemistry

1. http://www.sciencedirect.com
2. http://www.acs.org
3. http://www.google.co.in

Computer Applications

1. http://www.ieee.org/portal/site
2. http://citeseer.ist.psu.edu

Computer Science

1. http://portal.acm.org
2. http://www.ieee.org/portal/site
3. http://www.wikipedia.org

CELOS

1. http://optics.org
2. http://www.physics.org
3. http://www.iop.org

Engineering - Computer Science

1. http://www.ieee.org/portal/site
2. http://www.wikipedia.org
3. http://www.acm.org

Engineering - Civil

1. http://www.epa.gov
2. http://www.iwapublishing.com
2. www.tribology.com
3. http://www.scirus.com
3. http://www.isiwebofknowledge.com

Engineering - Electronics

1. http://nptel.iitm.ac.in
2. http://www.isteonline.in
3. http://www.aicte.ernet.in

Engineering - Fire & Safety

1. http://www.epa.gov
2. http://www.hazards.org
3. http://www.hsl.gov.uk

Engineering - IT

1. http://www.sciencedirect.com
2. http://www.google.co.in
3. http://www.ieee.org/portal/site
3. http://www.wikipedia.org

Engineering - Marine

1. http://www.lloydslist.com
2. http://www.sciencedirect.com
3. http://www.dgshipping.com

Engineering - Mechanical

1. http://www.sciencedirect.com
2. http://www.scirus.com
3. http://www.google.co.in

Environmental Science

1. http://www.sciencedirect.com
2. http://www.google.co.in

Industrial Fisheries

1. http://www.sciencedirect.com
2. http://www3.interscience.wiley.com
3. http://www.inomics.com

Instrumentation

1. http://www.aip.org
2. http://www.iop.org
3. http://www.sciencedirect.com

Marine Biology Micro Biology & Biochemistry

1. http://www.sciencedirect.com
2. http://www.springer.com
3. http://www3.interscience.wiley.com

Marine Geology and Geophysics

1. http://www.sciencedirect.com
2. http://www.google.co.in
3. http://www.wikipedia.org

Mathematics

1. http://www.ams.org
2. http://www.wikipedia.org
3. Queue system sites

Physical Oceanography

1. http://scholar.google.com
2. http://www.nasa.gov
3. http://www.whoi.edu
3. http://www.oceanographers.net

Physics

1. http://www.aip.org
2. http://www.iop.org
3. http://www.sciencedirect.com

Photonics

1. http://optics.org
2. http://www.physics.org
3. http://www.google.co.in

Polymer Science and Rubber Technology

1. http://www.sciencedirect.com
2. http://www3.interscience.wiley.com/cgi-bin/home
3. http://www.google.co.in

Ship Technology

1. http://www.sciencedirect.com
2. http://www.rina.org.uk
3. http://www.pubs.asce.org/journals

Statistics

1. http://scholar.google.com
2. http://projecteuclid.org
3. http://www.wikipedia.org

A.3.1.2 Preferred websites

The websites which are preferred by the academics of more than three departments are listed here along with the department names, and the websites are listed alphabetically.

AIP

Instrumentation, Photonics and Physics

epa.gov

Atmospheric Science, Engineering - Civil and Engineering - Fire & Safety

FAO

Environmental Science Industrial Fisheries and Marine Biology Micro Biology & Biochemistry.

Google

Atmospheric Science, Bio Technology, Chemistry, Engineering - Mechanical, Engineering - IT, Environmental Science, Industrial Fisheries, Instrumentation, Photonics, Physics, Polymer Science and Rubber Technology and Marine Geology and Geophysics.

IEEE

Computer Application, Computer Science, Engineering – Computer Science, Engineering - IT, Instrumentation, Photonics, Physics and Statistics

iop.org

Celos, Instrumentation, Physics and Photonics

Nature

Biotechnology, Environmental Science, Industrial Fisheries and Marine Geology

NCBI / Pubmed

Biotechnology, Environmental Science and Marine Biology Micro Biology & Biochemistry.

scholar.google

Marine Biology Micro Biology & Biochemistry, Physical Oceanography and Statistics

Science direct

Atmospheric Science, Biotechnology, Chemistry, Engineering - Civil, Engineering - Comp. Sci., Engineering - IT, Engineering - Marine, Engineering - Mechanical, Environmental Science, Industrial Fisheries, Instrumentation, Marine Biology Micro Biology & Biochemistry, Marine Geology and Geophysics, Physics, Polymer Science and Rubber Technology, Ship Technology and Statistics

Scirus

Engineering - Civil, Engineering - Mechanical, Industrial Fisheries and Photonics

Scopus

Chemistry, Engineering - Civil, Engineering – Mechanical and Physics

Springer

Atmospheric Science, Bio Technology, Chemical Oceanography, Chemistry, Environmental Science, Marine Biology Micro Biology & Biochemistry, Marine Geology and Geophysics, Mathematics, Polymer Science and Rubber Technology and Statistics

Taylor & Francis

Chemical Oceanography, Chemistry, Marine Biology, Marine Geology and Statistics

Wiki

Bio Technology, Chemistry, Computer Sci., Engineering - Comp. Sci., Engineering - IT, Marine Biology Micro Biology & Biochemistry, Marine Geology and Geophysics, Mathematics, Photonics and Statistics

Wiley

Chemical Oceanography, Environmental Science, Industrial Fisheries and Marine Biology Micro Biology & Biochemistry.

Yahoo

Chemistry, Industrial Fisheries and Marine Biology Micro Biology & Biochemistry.

A.3.1.3 Most preferred websites

Science direct, Springer and Wiki are the most preferred websites for the academicians of CUSAT.

A.3.2 UNIVERSITY OF KERALA

A.3.2.1 Department wise ranked websites

Aquatic Fisheries and Biology

1. http://www.fishbase.com/search.php
2. http://www.sciencedirect.com
3. http://www.google.co.in
3. http://in.yahoo.com/?p=us

Biochemistry

1. http://www.pubmedcentral.nih.gov/
2. http://www.google.co.in
3. http://www.sciencedirect.com

Bio-Informatics

1. http://www.pubmedcentral.nih.gov/
2. http://www.rcsb.org/pdb/home/home.do
3. http://www.bioinformatics.org/

Biotechnology

1. http://www.ncbi.nlm.nih.gov
2. http://www.rcsb.org/pdb/home/home.do
3. http://www.scirus.com

Botany

1. http://www.springer.com
2. http://www.pubmedcentral.nih.gov
3. www.silverplatter.com

Chemistry

1. http://www.sciencedirect.com
2. http://www.google.co.in
3. http://in.yahoo.com

Computer Science

1. http://www.ieee.org
2. http://www.elsevier.com
3. http://www.acm.org

Demography

1. http://db.jhuccp.org/ics-wpd/popweb
2. http://www.google.co.in
3. www.isp.org

Engineering - Civil

1. http://www.google.co.in
2. http://in.yahoo.com/?p=us

Engineering - Computer Science

1. http://www.wikipedia.org/
2. http://www.google.co.in

Engineering - Electronics

1. http://www.google.co.in

Engineering - Mechanical

1. http://www.google.co.in
2. http://www.mechanicalengineer.com/

Environmental Science

1. http://www.google.co.in
2. e-journals of the University
3. http://in.yahoo.com
3. http://www.interscience.wiley.com/

Future Studies

1. http://www.elsevier.com/
2. http://www.wikipedia.org/
2. http://www.acm.org/
3. http://onlinedatabases.com/

Geology

1. http://www.sciencedirect.com/
2. http://www.springer.com
3. http://www.ceeindia.org/

Mathematics

1. http://www.wikipedia.org/
2. http://www.vedic-mathematics.com
3. http://mathworld.wolfram.com/

Optoelectronics

1. http://www.iop.org
2. http://www.aip.org/
3. http://www.google.co.in

Physics

1. http://www.google.co.in
1. http://www.wikipedia.org
2. http://www.aip.org
3. http://www.iop.org
3. http://www.sciencedirect.com

Statistics

1. www.springerlink.com
2. http://www.ams.org
3. http://www.jstor.org

Zoology

1. http://scholar.google.co.in
2. http://www.pubmedcentral.nih.gov
3. www.biologist.com

A.3.2.2 Preferred websites

The websites which are preferred by the academics by more than three departments are listed here along with the department names, and the websites are listed alphabetically.

google.co.in

Aquatic Fisheries and Biology, Biochemistry, Bioinformatics, Chemistry, Demography, Engineering– Civil, Engineering- Electrical, Engineering – Electronics, Environmental Science Mathematics, Optoelectronics Physics and Statistics.

Jstor

Botany, Chemistry and Statistics,

Nature

Aquatic Fisheries and Biology, Biochemistry, Bio-Informatics, Botany, Environmental Science, Optoelectronics, Physics and Zoology.

Scholar.google.co.in

Botany, Engineering - Mechanical and Zoology.

Science direct

Aquatic Fisheries and Biology, Biochemistry, Biotechnology, Botany, Chemistry, Geology Optoelectronics, Physics, and Zoology.

Springer

Aquatic Fisheries and Biology, Biochemistry, Botany, Computer Science, Geology Optoelectronics, Statistics and Zoology.

Yahoo

Aquatic Fisheries and Biology, Biochemistry, Chemistry, Demography, Engineering-Civil, Environmental Science, Physics and Zoology.

A.3.2.3 Most preferred websites

The most preferred websites by the academicians of University of Kerala is Science direct followed by Nature, Springer and Yahoo.

LIST OF PUBLICATIONS

1. **Information seeking behaviour in the electronic era: a case study of science and technology research scholars of Cochin University of Science and Technology** *In H.K. Kaul and J. Dominic* [eds.]. *Knowledge, Library and Information Networking NACLIN 2008.* New Delhi: Delnet, 2008 pp. 266-287. (co-authored by Dr. (Mrs.) M.D. Baby).

2. Presented a paper titled **Information technology in curriculum restructuring in Library and Information Science** *In* XVII IATLIS seminar held at Thiruvananthapuram on 2001 (co-authored by Shynu Ray.S).

3. **Changing faces of Libraries** *In* new challenges in Librarianship, Edited by Dr. G. Devarajan, ESS ESS publication, 2001. p. 74-81. (co-authored by Shynu Ray.S).

4. Presented a paper titled **Role of librarians in collection development and management in seminar on collection management and loss of books in academic libraries** conducted by Kerala Library Association on 18th November 2000. (co-authored by Shynu Ray.S).

5. **Library computerisation in India: an overview** *In* 50 years of Indian librarianship, Edited by Dr. G. Devarajan, ESS ESS publication, 1999. p. 214-223. (co-authored by Shynu Ray.S).

6. **Electronic journals** *In* 50 Years of Indian Librarianship, Edited by Dr. G. Devarajan, ESS ESS publication, 1999. p. 252-263. (co-authored by Shynu Ray.S).

7. **How to write a technical report** *In* KELPRO Souvenir, 1999. p. 66-70. (co-authored by Shynu Ray.S).

8. **Thiruvananthapuram Library Network: a birds eyeview** *In* KELPRO Souvenir, 1999. p. 61-64. (co-authored by Shynu Ray.S).

9. **Library software's in India** *In* KELPRO Bulletin 3(1) 1999 p. 53-66. (co-authored by Shynu Ray.S).

10. **Indian copy right in digital era** *In* KELPRO Bulletin 2(2) 1998 p. 95-100. (co-authored by Shynu Ray.S).

11. Presented a paper titled **School libraries and information technology** *In* National Seminar on School libraries and the Education System conducted by Government of Kerala (SCERT) and Kerala Library Association, on 19-20th November 1998. (co-authored by Shynu Ray.S).

12. Information seeking behaviour of science and technology research scholars of University of Kerala (paper communicated).