

**Internet Utilization and Academic Activities of  
Faculty Members in the Universities of Kerala :  
an analytical study**

by

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**THESIS**

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of the requirement for the degree of**

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Science**

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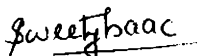
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## Declaration

I hereby declare that the thesis entitled “Internet utilization and academic activities of faculty members in the universities of Kerala : an analytical study submitted to Cochin University of Science and Technology in partial fulfillment of the requirements for the award of the Degree of Doctor of Philosophy in Library and Information Science is the original record of the studies. This research carried out by me in the university during 2004-2008 under the guidance of Dr. Humayoon Kabir and it has not formed the basis for the award of any degree, diploma, title or recognition.

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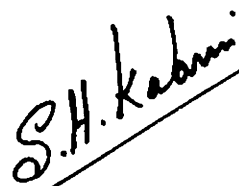
  
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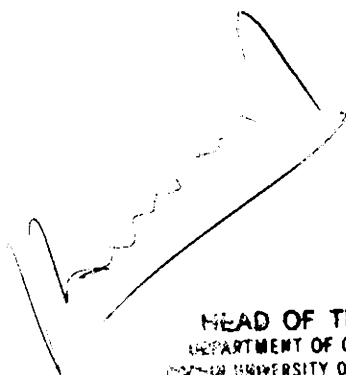
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## List of Abbreviations

ARPA	Advanced Research Projects Agency
BBN	Bolt Beranek and Newman
BBS	Bulletin Board System
BITNET	Because It's Time Network
BRS	Bibliographic Retrieval Services
BUBL	Bulletin Board for Libraries
CERFNET	California Education and Research Federation Network
CREN	Corporation for Research and Education Networking
CSMA/CD	Carrier Sense Multiple Access/Collision Detection
CSNET	Computer Science Network
CUSAT	Cochin University of Science and Technology
CWIS	Campus Wide Information System
DNS	Domain Name System
DoD	Department of Defence
EARN	European Academic and Research Network
EJ	Electronic Journal
EP	Electronic Publishing
FTP	File Transfer Protocol
IANA	Internet Assigned Numbers Authority
IESG	Internet Engineering Task Force
IMP	Interface Message Processor
IP	Internet Protocol
IR	Internet Registry
IRSG	Internet Research Steering Group
IRTF	Internet Research Task Force
ISO	International Organization for Standardization
ISOC	Internet Society



KAU	Kerala Agricultural University
MGU	Mahatma Gandhi University
NREN	National Research and Education Network
NSF	National Science Foundation
OLE	Object Linking and Embedding
OSI	Open Systems Interconnection
PPP	Point-to-Point Protocol
RFC	Request For Comments
SGML	Standard Generalised Mark-up Language
SSUS	Sree Sankaracharya University of Sanskrit
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
UCB	University of California at Berkeley
UDP	User Datagram Protocol
USENET	Users' Network
WAIS	Wide Area Information System
WWW	World Wide Web

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# Chapter I

## Introduction

In man, the urge to disseminate knowledge is as strong as the urge to acquire it. The dissemination of knowledge has grown mind-bogglingly from the centuries-old oral instruction to today's internet browsing. Oral instruction, which was the only way of spreading knowledge from primeval times until the invention of letters and writing, had a very limited reach. A master could teach no more than a handful of disciples in his life time; a preacher could cover no more than a few hundred miles in his life time. The reach was so limited that scholarly knowledge became the right of a privileged few, creating a learned class of people in each society, like the Pharisees and Sadducees among the Jews and the Brahmins among the Indians. The first significant breakthrough in the dissemination of knowledge was the invention of the paper in 100 A. D. in China. But the invention that gave it truly a universal reach, both spatially and demographically, was the invention of printing by Johan Guttenburg of Germany in 1450 A. D. which made knowledge available to all those who could afford to buy books. That still left a huge portion of available knowledge out of the reach of a vast majority of the world's population that could not foot the costs of books. The world had to wait until the development of the INTERNET in the latter half of the twentieth century for all knowledge to become available universally and immediately at home at an affordable rate.

Some of the factors that led for the emergence of internet are as follows:

- Declining price of computers and other electronic gadgets
- Sharing of resources and information
- Saving time in communication
- Escalating price of journals and books
- Decreasing budget
- Avoiding duplication in the holdings of the library.

Internet use is increasing rapidly with a trend that shows no signs of diminishing. It is spreading rapidly into daily life and directly affecting people's ideas and behaviour. Internet has transformed our lives and the way we communicate, how we learn, how we work and spend free time, in essence it has more or less changed every aspect of human society one can think of. Internet, an open computer communication infrastructure and network of networks also known as the cyberspace, information superhighway, the net etc. A traditional avenue for sharing research data and information, internet has brought in a new era in global communications. Internet is holding enormous volumes of information in each and every field of human knowledge. Internet heralded the development and implementation of new and innovative teaching strategies in higher education.

Developments in information and communication technologies have a drastic influence on every sphere of academic activity. Computers have been used in education for more than four decades, and they have now been accepted "unconditionally" as an integral part of our entire educational system. The internet provides a wealth of information. In modern information era, internet has become an invaluable tool for teaching, learning and research. It has changed the traditional methods of research, preserving, retrieving and communicating of information of academic community. The internet has become an invaluable tool for teaching, learning and research. The benefits are so great that there is no sphere of life without an internet application. Internet can help faculty members to get the nascent information in their concerned subjects without time lag and that can be incorporated into their teaching.

### **1.1 Statement of the Research Problem**

The problem of this research is "**Internet utilization and academic activities of faculty members in the universities of Kerala : an analytical study.**"

## **1.2 Research Objectives**

1. To assess the knowledge and attitude level of the faculty members regarding internet services.
2. To find out the importance given to internet facilities by the faculty members.
3. To investigate the learning strategies adopted by the faculty members in acquiring internet skills.
4. To know the frequency of using internet services by the faculty members.
5. To find out the purpose of using internet services.
6. To examine the influence of internet on the various academic activities of faculty members.
7. To investigate whether the availability of internet services replace library services.
8. To compare the use of internet and conventional documents.
9. To find out and enumerate the problems faced by the faculty members in utilizing internet services.
10. To propose ways and means to increase the use of internet by the faculty members.

## **1.3 Hypotheses of the study**

1. The Knowledge regarding internet varies according to category.
2. Attitude towards Internet is positively related to years of service.
3. Higher the duration of using internet higher the attitude towards internet.
4. Higher the Internet literacy better the search results.
5. Higher the Internet literacy higher the influence on teaching efficiency.

## **1.4 Need and Significance of the study**

The present era is in a rapid flux due to the communication and information explosion. Newer and newer communication techniques are coming forth day-by-day. One common and very important mode of communication and information of the present times is the Internet. It is used widely and extensively for



communicating with others and for eliciting information. It is used by scholars, academicians, executives and every other citizen for one reason or the other.

Information inputs from across the whole world are in the reach of every one due to the internet facility. It improves the quality of teaching, research and education at large provided it is used properly and effectively. However, it is not known how far these facilities are used by the faculty members of the various universities and if they are using it how far it has improved their efficiency as well as the efficiency of the students. It is in this context, the researcher thought to have a probe into the internet utilization of the faculty members of various universities in Kerala.

The study which unearths the utilization pattern of the internet facilities will bring forth findings that would be an indicator to the universities on the input of the faculty members on the latest developments to a great extent. It would also bring forth the facilities available and to enhance these facilities if need be in order to make use of the world level knowledge by the faculty members. It would also throw open newer vistas of research in the area.

Further, the present study can also serve as a data bank for scholars and authorities of the various universities for further reference and also to design strategies and plans to develop the university libraries in accordance with the modern times whereby the faculty members as well as the students /scholars could become efficient in teaching as well as make their works more creative, productive and world standard ones.

### **1.5 Limitations of the study**

The research study is not devoid of limitations. The important limitations of the study are: Those faculty members who are in Centres, Affiliated Colleges, FIP programme, Long Leave etc. are excluded from the study. Regarding utilization, knowledge and their satisfaction on internet, the data were based on their perception only instead of any test or examination to assess their knowledge and utilization. Further internet facilities available at the universities too were

considered only based on their perception and no field level investigation was resorted to in this regard. Hence, bias could have been involved in their responses.

### **1.6 Definitions of major key terms**

Most of the terms in the title are self explanatory. The two important key words are defined below:

**Internet :** Internet Society (ISOC) defines Internet as ‘global network of networks’ enabling computers of all kinds to directly and transparently communicate and share services throughout the world using a common communication protocol.

**Academic activities :** In this study academic activity refers to learning, teaching, publication and guiding research.

### **1.7 Organisation of the Thesis**

The thesis is organized in six chapters. Different aspects in each chapter are arranged in the following pattern.

Chapter 1, *Introduction* gives a general introduction on internet. This chapter also covers relevance of the study, objectives of the study and organization of the study. Chapter 2., *Internet : History and services* covers the origin, development and growth of internet and its various services. Chapter 3, *Review of Literature*, which covers the related studies of various internet use patterns from different academic fields. Chapter 4, *Methodology* which covers the tools used in the study, statistical techniques employed in the analysis are described. Chapter 5, *Analysis of the data*, concerned with the analysis of data obtained from the questionnaires and described it with interpretations, tables and graphs. Chapter 6, *Findings and Conclusion*, which provides summary of findings, tenability of hypotheses suggestions and conclusion.

## **Chapter II**

### **Internet : History and Services**

The internet is the name for a vast, world wide system consisting of people, information and computers. It is used by millions of people all over the world to access and exchange information. Users range from researchers, educators, students, government officials and business personnel to private citizens. It has evolved as a new scholarly communication system.

#### **2.1 Definition for Internet**

The Federation National Council (FNC) in 1995 referred the internet as global information system that

- (i) is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions;
- (ii) is able to support communications using Transmission Control Protocol/Internet Protocol (TCP/IP) suite or its subsequent extensions, and/or other IP compatible protocols; and
- (iii) provides, uses or makes accessible, either publicly or privately, high level services layered on the communications and related infrastructure described herein.

#### **2.2 Internet History**

##### **2.2.1 ARPANET**

The history of the internet can be traced from 1969, when the U.S. Department of Defense started a network called ARPANET (Advanced Research Projects Agency Networks) as part of their research initiative. ARPA (Advanced Research Project Agency) itself was formed in response to the challenge posed by the erstwhile U.S.S.R (Union of Soviet Socialist Republics) in the field of science and technology particularly considering the cold war situation prevailing at that time. ARPA later came to be known as DARPA (Defense Advanced Research Projects Agency). In 1960 Paul Baran who was considered as the father of networking presented his ideas in a series of reports published by RAND. During the same period

Leonard Kleinrock created a kind of role model for the design and performance evaluation of networks in his dissertation, *Communication Nets: Stochastic Message Flow and Delay*, at Massachusetts Institute of Technology (MIT) (Lynch & Rose, 1995).

In 1965, MIT's Lincoln Laboratory commissioned Thomas Marill at Computer Corporation of America, in Cambridge (USA) to study computer networking. As the outcome of this study a report was submitted with the title, *A Co-operative Network of Time sharing computers*. This resulted in the linking of two computers, one SDC (Systems Development Corporation) AN FSQ-32 and the other a Lincoln Laboratory TX-2 which could be successfully linked. After this, a small DEC (Digital Equipment Corporation) computer at ARPA was added to the linking to make it an "Experimental Network".

Another technical development that had an impact on the ARPANET was a broad system design of the NPL Data Network, undertaken at the National Physical Laboratory (NPL) in Middlesex, UK under D.W. Davies (Lynch & Rose, 1995). This design was similar to the network proposed by Paul Baran. NPL design proposed that local networks be constructed with interface computers that would multiples among a number of user systems and communicate with a high level network. In 1967, Wes Clark of Washington University suggested that a small computer could be inserted between each participant's computer (the host) and the phone line and these are called Interface Message Processor (IMP). IMPs provide the sub-network through hosts to communicate. IMPs are small, special purpose computers connected to each other by phone lines. In July 1968 a company called Bolt Beranek and Newman (BBN), introduced a protocol for a host to communicate with a router over a link. A host could send messages to its IMP, which would then break these into packets and forward them independently towards the destination. This process is called Packet Switching. Using this technology, Military Communications could be maintained in the event of nuclear war which might affect the communication lines.

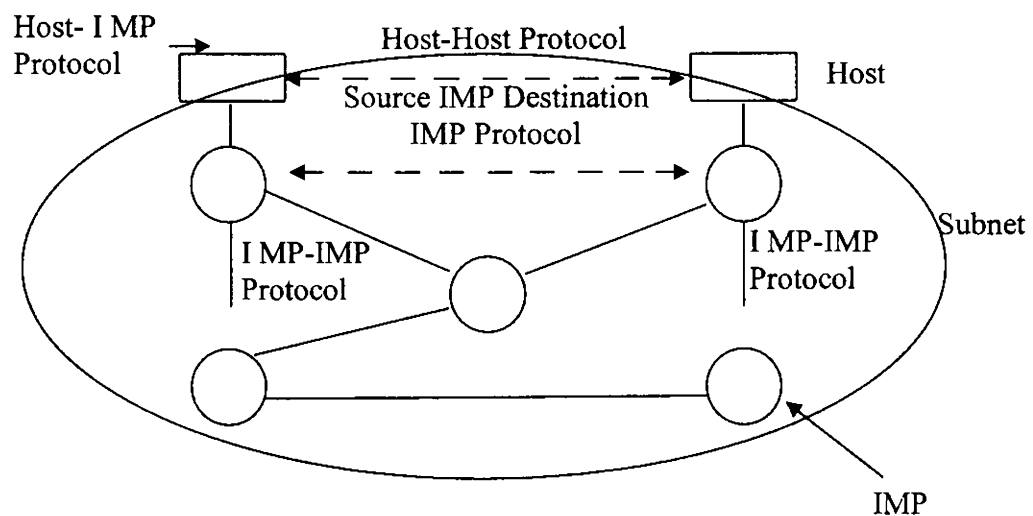
Finally on December 5, 1969, the ARPANET was officially established by connecting four academic and research institutions, namely the

University of California at Los Angeles (UCLA), the University of California at Santa Barbara (UCSB), the University of Utah at Utah, Stanford Research Institute, Menlo Park forming the first distributed packet switching network.

ARPANET was designed for two purposes:

- To facilitate ARPA's administrative work by providing a quick and convenient form of communication.
- As an experiment in military communications that might be resistant to nuclear attack.

**Figure 2. 1. Tanenbaum (1997) figured the original ARPANET design as follows:**



In 1974 Bob Kahn and Vinton Cerf invented a new protocol called Kahn-Cerf protocol, which later came to be known as Transmission Control Protocol/Internet Protocol (TCP/IP). TCP/IP was specially designed to handle communication over internet works, as more and more networks were hooked up to the ARPANET. In the early 1980's the ARPANET was split into two : the military section separated as MILNET, while research and development and other sectors stayed on the ARPANET (Lynch & Rose, 1995).

### **2.2.2 The Contribution of NSFNET to Internet development**

By using the ARPANET, scientists of the universities could share their data on research projects. However to get on the ARPANET, a university needed a research contract with the Department of Defense, which many did not have. This lack of universal access prompted the US National Science Foundation (NSF) to create a virtual network, called CSNET (Computer Science Network) centered around a single machine at Bolt Beranek and Newman (BBN) during late 1970's (Tanenbaum, 1997). This supported dial-up lines and had connections to the ARPANET and other networks like UUCP (Unix to UNIX Copy mail networks), USENET (User's Network), BITNET (Because It's Time Network) etc. By 1984 NSF began designing a high speed successor to the ARPANET that would be open to all university research groups. NSF connected its six supercomputer centres in San Diego, Boulder, Champaign, Pittsburgh, Ithaca and Princeton. This network acted as a backbone network of NSF. NSF also funded some regional networks that connect to the backbone to allow users at thousand of universities, research laboratories, libraries and museums to access any of its supercomputers and to communicate with one another. The complete network, including the backbone and the regional networks was called NSFNET.

In 1986, the NSFNET was connected to the ARPANET. In 1987, the contract to manage the NSFNET was given to Merit Network Inc., a non profit consortium of eight Michigan Universities. The funding for this was provided by the NSF and the State of Michigan. In 1990, ANS (Advanced Networks and Services) took over NSFNET. In December 1991, the US Congress passed a bill authorizing the National Research and Educational Network (NREN) to become the research successor to NSFNET (Tanenbaum, 1997). This network was considered as a prototype for the other networks. During this period numerous companies were running commercial IP networks. In 1995, since ANSNET was sold to America Online, the NSF regional networks had to go out and buy commercial IPs services to

interconnect. The NSFNET was decommissioned in April 1995 by awarding contracts to four different operators to establish NAPs (Network Access Points). These operators were Pac Bell (San Francisco), Ameritech (Chicago), MFS (Washington, DC.), and Sprint (New York). Every network operator that wanted to provide backbone service to the NSF regional networks had to connect to all the NAPs. This arrangement meant that a packet originating on any regional network had a choice of backbone carriers to get from its NAP to the destination's NAP (Tanenbaum, 1997) Besides the NSF NAPs, various government NAPs (eg. FIX-E, FIX-W, MASE-East and MASE-West) and commercial NAPs (eg. CIX) have also been created. Due to the arrival of these NAPs, the concept of a single default backbone was replaced by a commercially driven competitive infrastructure. The growth of networks in other countries like JANET (Joint Academic Network) in UK, SURFNET in Netherlands, UNINET in Norway established the infrastructure for the internet.

### **2.2.3 The internet**

From the initial of four computers in 1969 the internet grown over the next ten years to connect 200 computers in military and research establishments through out USA with a few overseas links. On January 1, 1983 TCP/IP became the official protocol and by this time number of machines, networks and users connected to the ARPANET also increased. When NSFNET and the ARPANET were interconnected, the growth became exponential. Until 1983 the internet consisted of fewer than 500 host computers, which were in American military laboratories and academic computer departments. As on July 2008, the number of internet hosts is enumerated in the following graph.

**Fig. 2.2**

**Internet Domain Survey Host Count**

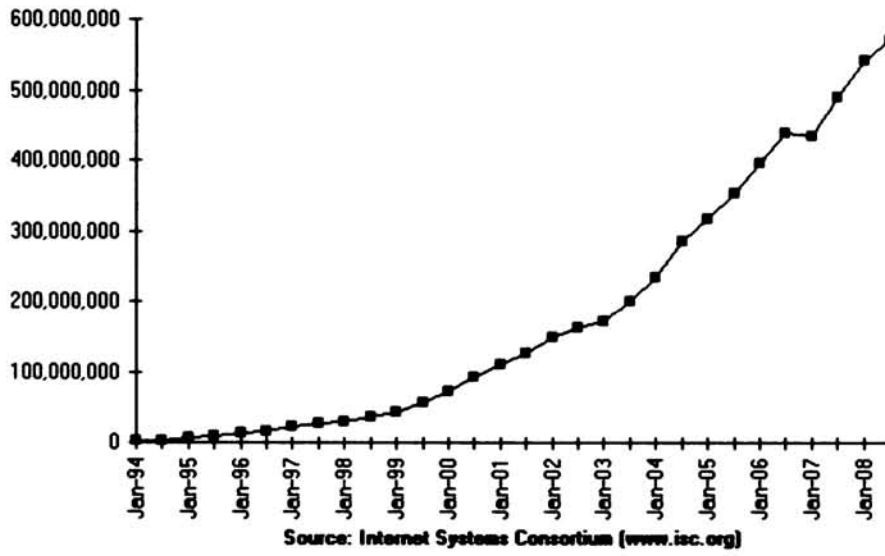
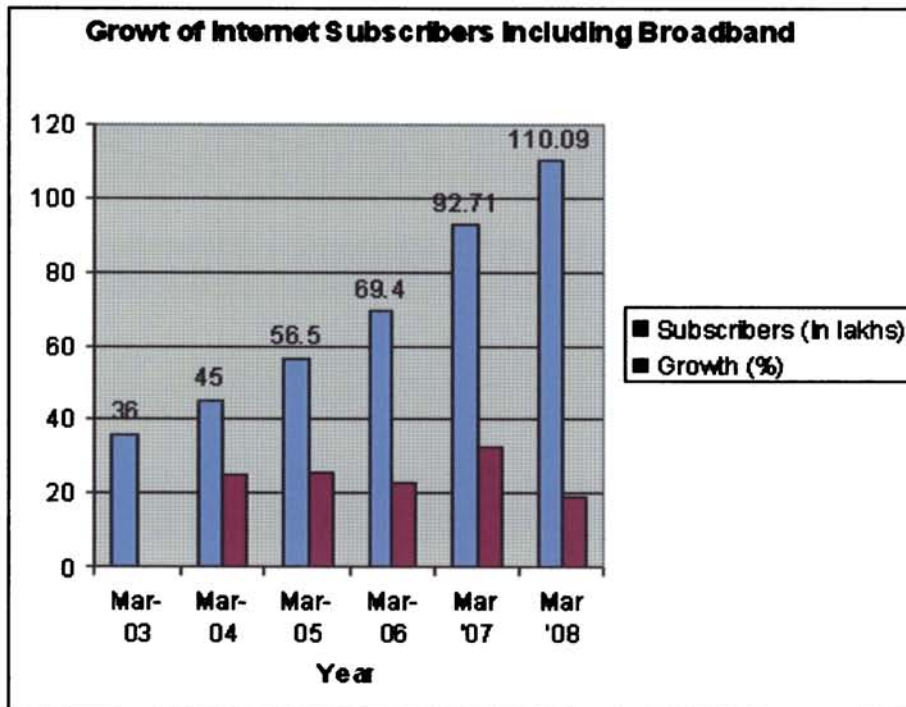


Fig. 2.3 The number of internet subscribers as on March 2008 from [www.isoc.org](http://www.isoc.org) is figured below.





## **2.3 Connection to the Internet**

Local area networks can be attached to the internet by installing TCP/IP networking software on the LAN server and obtaining a connection between the LAN and the internet. There are three types of net connections: Full, Dial-up and Gateway.

- Full Internet Connection, where there is a permanent telecommunication links, and the computer has a registered internet name and address;
- Dial-up Connection, via a temporary telecommunications link to a machine that does have full access;
- Gateway Connection, where a connection is made through another network.

## **2.4 Allied Agencies of Internet**

Internet has no central authority to control the system. But there are voluntary agencies helping the development of internet.

### **2.4.1 The Internet Society**

The Internet Society (ISOC) is an international non-profit membership organization formed in January 1992. Its activities include imparting education about how to use the internet and exploration of new applications. It is also responsible for internet design and future planning. ISOC act as the organizational home of the Internet Engineering Task Force(IETF), Internet Architecture Board (IAB), Internet Engineering Steering Group (IESG) and Internet Research Task Force (IETF). ISOC holds an annual meeting and publishes a news letter called, Internet Society News.

### **2.4.2 Internet Architecture Board (IAB)**

When the ARPANET was set up by Department of Defense, USA created an informal committee called Internet Activities Board (IAB) in 1983 to oversee the ARPANET and to keep the researchers involved with the ARPANET. The meaning of the acronym IAB was later changed to Internet Architecture Board. Today, the aim of this organ is to bring together and coordinate the members from all walks of life concerned with the evolvement and smooth operation of the Internet. According to Vinton Cerf, The IAB is an independent committee of researchers and

professionals with a technical interest in the health and evolution of the internet system. IAB members are deeply committed to making the internet function effectively and evolve to meet a large scale, high speed future. This has to have principal task forces such as Internet Research Task Force and Internet Engineering Task force. The responsibilities of the IAB are architectural oversight of IETF activities, internet standards review oversight and appeal, management of the IETF protocol parameter registries and the appointment of the RFC editor. The IAB supervises the Internet Engineering Task Force (IETF) which oversees the evolution of TCP/IP and the Internet Research Task Force (IRTF) which works on network technology.

**(a) Internet Research Task Force (IRTF)**

It is responsible for topics that are oriented more towards research than towards operational engineering. It gives more importance to the evolution of the future internet by creating focused, long term and small research groups working on topics related to internet protocols, applications, architecture and technology. The research groups work on internet protocols, applications, architecture and technology. This has a steering group called Internet Research Steering Group (IRSG). IRTF is managed by the IRTF chair in consultation with IRSG. IRSG manage the research groups, conducting workshops on research areas of importance to the evolution of internet.

**(b) Internet Engineering Task Force (IETF)**

Detailed work on TCP/IP protocols and specifications for standardisation is done by the Internet Engineering Task Force. The IETF has Working Groups that handle specific design and specification projects. The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas such as routing, transport and security. Internet Engineering Steering Group (IESG) is the steering group of IETF. The IETF holds meetings 3 times per year.

### **2.4.3 Internet Assigned Numbers Authority (IANA)**

This organization maintains a registry of network accessible databases, RFC (Request for comments) documents and Internet protocols. IANA is situated at the University of Southern California Information Services Institute. IANA'S various activities can be broadly grouped into 3 categories.

1. Domain names : IANA manages the DNS root, the .int and .arpa domains and an IDN practices resource.
2. Number resources : IANA coordinates the global pool of IP and AS numbers, providing them to regional internet registries.
3. Protocol assignments : Internet protocols numbering systems are managed by IANA in conjunction with standard bodies.

## **2.5 Some Technical Details of Internet**

### **2.5.1 Packet Switching**

In Packet Switching, messages are split into a number of packets, often fixed in size, and the packets are transmitted in a 'store and forward' fashion. Messages are split at the source host and reassembled at the destination host. Each packet transmission is independent of the others. A packet that can be routed in a self contained manner called a datagram. Along with the user data, every packet must carry the complete address information such as:

- Destination Identifier.
- Source Identifier.
- Message Identifier.
- Packet identifier.

These packets are forwarded individually by adjacent computers on the network, acting as routers and reassembled in their original form at their destination. Because packets can take alternative routes through the network, data transmission is easily maintained even if parts of the network are damaged or not functioning efficiently.

Sinha (1992) identifies the following advantages of Packet Switching ;

- Unlike messages, packets are of small and fixed size. Hence the storage requirements for buffering the packets at intermediate nodes are minimal.
- Since the routing is done on packet basis, the intermediate nodes do not have to wait for the entire message, hence the transmission is very fast. The method is fast enough for interactive/real time applications.

### **2.5.2 Client-Server Model**

Internet services are designed on the Client-Server Model. Client is the requester and Server is the provider. Client-Server model divides the service into three parts and each part has a significant role in implementing the Internet service. The three parts of client-server model are:

1. *The client process*, which uses the service
2. *The server process*, which provides the service
3. *The protocol*, used to communicate the client and server with each other.

The difference between a client and a server is that a client initiates a connection with a server while a server waits for client connection requests.

### **2.5.3 Transmission Control Protocol/Internet Protocol (TCP/IP)**

Transmission Control Protocol and Internet Protocol are two specific protocols which are crucial to all Internet communications. They are commonly spoken together as TCP/IP and together, they define the common language of the Internet.

The Protocol is essentially a set of rules by which the communication take place between users on the network (Aptagiri, 1995). Protocols are useful in communication between different kinds of machines even with different operating systems. TCP/IP was developed by Bob Kahn from DARPA and Vinton Cerf at

Stanford University in 1974 with a purpose to connect different networks to each other.

TCP/IP Protocols have five layers. That is, the protocols are divided into layers to reduce conceptual complexity. A protocol in a given layer can be described by the services it provides to the next higher layer and by the services it uses from the next lower layer. Carl-Mitchell and Quarterman (1995) described the TCP/IP layers are as follows;

**Physical** The Internet protocol model is really about software, not hardware, so there is no physical layer as such. But we can call everything under the network layer the physical layer.

**Network** The network layer contains whatever IP will runover, such as Ethernet, token ring, FDDI (Fiber Distributed Digital Interface) etc. A network layer protocols routes packets across a network. A link layer is sometimes separated out at the lower end of this layer.

**Internet** The Internet layer is the key layer. It has only one protocol: Internet Protocol (IP). IP provides many of the same functions as the network layer, such as addressing and routing. But it provides them and a common address space across multiple lower layer network protocols, thus permitting the construction of Internets.

**Transport** The transport layer handles data consistency functions. TCP and UDP (User Datagram Protocol) are transport layer protocols. TCP provides a reliable byte stream over a connection between two processes and ensures that data arrives and that it arrives in order and without errors. UDP makes an effort to deliver datagrams but doesn't ensure order or prevent packet loss or duplication.

**Process/Applications** This layer provides application services to users and programmes.

The Transmission Control Protocol (TCP) controls how computers and networks manage the flow of information among themselves. TCP divides the information into packets transmitted over electronic communications between computers. IP does the actual transmitting, making it possible for the information to

get through the gateways between the sending computer and the receiving computers. In the receiving end TCP reassembles the packet of information and checking them for errors. TCP guarantees that the packets sent through the internet are properly packaged and transmitted in a reliable fashion. Once around with IP address, the computer can send the information in the right direction until it reaches another computer which reads the destination address and sends it along.

## **2.6 Host**

TCP/IP Network consists of two components such as host and routers. The host is a computer system used for application processing on a network. The host can range in size from mainframes to PCs. Every host is a computer on the Internet and has a unique address, which is a 32 bit number (eg. 250.50.15.6). The number furthest to the left represents a larger network and the extreme right number in the address indicates the specific network.

## **2.7 Router**

Router is the device which reads the address on packets it receives and routes these packets to destination depending on the routing table it gets or develops. A router is formed by a routing algorithm (software). It interconnects two dissimilar sets of networks, data link and physical layers.

Router has a processor and three types of RAM such as NVR (Non Volatile RAM), flash and packet memory. The RAM capacity varies from 16 to 32MB. The other parts of the router are as follows:

- Two Asynchronous ports
- Ethernet port
- Two synchronous serial ports
- A console to monitor the router
- Power
- Auxiliary port to remote configuration.

## 2.8 Internet Service Providers (ISPs)

Internet Service Providers are commercial companies and other organizations who give access to Internet through dial up or leased lines. Around 36 internet service providers in India provides internet services.

## 2.9 Internet Services

### 2.9.1 Electronic Mail (E-mail)

Electronic mail has been and remains one of the most highly used functions of the Internet. Originated in 1960, E-mail is actually electronic correspondence. Electronic mail differs from the other applications of the Internet because it is not an 'end-to-end' service, ie. the sending and receiving mechanics need not be able to communicate directly with each other to make it work.<sup>11</sup> It is rather a 'store and forward service' and the mail is passed from one machine to another until it finally arrives at its destination or addresses. So electronic mail needs a proper address. The form of the E-mail address is:

*userid.host.Subdomain.first level domain*

the address is in several parts, each of which is separated by a period. The first part, *userid* represents the user's identification. The *host* is the name of the server machine and the *subdomain* indicates the location of the machine. For instance, *edu* stands for educational sites, *com* stands for commercial sites, *gov* stands for government sites and *org* stands for organization sites. The *first level domain* indicates the country. For India it represents as *in* and for US it is *us*.

Each system has some available software that manages and control the transfer of the messages. Examples for such software are Pine, Eudora, X-Mail, Pegasus etc. Every e-mail consists of four elements such as:

- The address of the recipient
- The address of the sender
- A subject line and
- The letter/ message.

Functions supported by e-mail system are:

1. **Composition** : It refers to the process of creating messages and answers.
2. **Transfer** : It refers to moving messages from the originator to the recipient.  
The e- mail system should do this function automatically.
3. **Reporting** : It has to do with telling the originator what happened to the message.
4. **Displaying** : This displays the incoming messages so that people can read their e- mail.
5. **Disposition**: It is the final step and concerns what the recipient does with the message after receiving it.

Based on the target group, E-mail can be conveniently grouped into four groups, namely, one-to-one, one-to-many, many-to-one and many to many. Speed, reliability of delivery and security and privacy of messages are the three important beneficial characteristics of E-mail.

### 2.9.2 File Transfer Protocol (FTP)

FTP is defined as a programme for transferring files from the remote computer to user's computer. Information is stored on thousands of computers all around the world in their own file systems in the form of text, video, sound and computer programmes. For the transferring of files from one computer to another computer, File Transfer Protocol is used. The files are kept at FTP sites, which are computers on Internet. The place where the file is kept is called an FTP site and this is accessible to the general public. While dealing with different types of files, there are two things to determine;

- What type of information the file holds, and
- What type of computer the file can be used on.

By noting the filename extension we can identify the above two points. FTP requires specific address to the machine with which the file exchange has to take place. For FTP programme, the command used in the internet is

*:/ftp remote machine-name*



When the FTP programme starts, the identity of the user such as login name or a password is entered. Thereafter the file transfer can be done. To get and put files the commands are:

*ftp>get source-file destination -file*

*ftp>put source-file destination -file*

X-mode, Kermit, WS-FTP, Win FTP are some of the file transferring programmes.

There are two methods for using FTP. In one method, the user signs on to the remote host with user's own account or ID and transfers file. In the other, the user signs on as a guest or as an anonymous user and transfers files. This method is called "Anonymous FTP".

### **2.9.2.1 Anonymous FTP**

Anonymous FTP is one of the most important and most widely used services on the Internet. Anonymous FTP is a facility that lets user connect to certain remote hosts and download files without being registered as a user. To do so, login the e-mail address as a special user name as anonymous. Using anonymous FTP, one can copy files from thousands of different computers all over the Internet. These files contain virtually every kind of information that can be stored on a computer. The peculiarity of this system is that it allows anyone on the Internet to login to a remote host and download public files without having an account on that system. One thing to taken care of is that the anonymous user name will only work with computers that have been set up to act as anonymous FTP servers, which are those computers that are set up as repositories of publicly available files.

#### **Specialities of anonymous FTP**

- i. Anonymous FTP allows to download any type of information, covers every conceivable topic as free.
- ii. It is the principal way in which software is distributed on the Internet. For example, through anonymous FTP one can access the USENET software for the introduction of USENET discussion group.
- iii. It is used to achieve and disseminate the technical information that defines and supports the Internet in an organized and reliable manner around the world. Internet is based on a large number of protocols and conventions. Each such

protocol is explained in a technical publication called REQUEST FOR COMMENTS (RFC). This ensures that all Internet programmes are designed to follow the same set of standards.

Steps involved in accessing the Anonymous FTP

1. ***Establish a connection to the remote host by specifying the name of the remote computer.*** Enter user name as anonymous and e-mail address as password. Once the connection is established, FTP client will request a listing of the contents of the top level directory. Then the information will be displayed on the right with the directory names on top and the file names at the bottom.
2. ***Navigate to the directory on the remote host that contains the file which is needed and select the required file.***
3. ***Set the options for the transfer:*** Options can be set to specify what type of file transfer is to be done. For example, ASCII transfer for text files, binary transfer for binary files like files of pictures, audio etc.
4. ***Select the file to be transferred.***
5. ***Navigate to the directory on the local host to download the file:*** In the local host set up the directory where the files get copied.
6. ***Initiate the file transfer:*** By clicking on the “transfer” button the file is copied from the remote computer to the local computer.

### **2.9.3 Telnet**

Telnet is one of the oldest applications on the Internet introduced in the early 1970s. Telnet facility enables to login to another host computer on the Internet. It gives the opportunity to be on one computer system and do work on another, which may be far away from the user’s computer. Due to this facility, people can work on computers around the world. According to Cady and Mc Gregor (1996, p.272) “Telnet is the Internet tool that lets one travel from one’s own workstation out into cyberspace to “land” on another computer”. The computer requesting a service is called the client and the computer providing the service is called server. Telnet is also known as Remote login. EWAN, NCSA WINTEL, YAW Tel, CSMRLW, TekTel are some of the programmes for telnet applications.

Telnet's responsibility is two fold:

- It act as a transportation system to take the user to the host; and
- It sits in the background and transports the work session information that's happening on the host system back to user's screen.

The command used for accessing remote machine is:

*%telnet remote computer name*

Telnet is used to access a lot of public services including library catalogues and other kind of databases. For example the Library of Congress database is accessible via telnet. It offers a catalogue of the library's holdings, federal legislation, copyright information etc.

To get information about a particular document in the Library of Congress, the entry is:

*telnet to: locis.loc.gov*

#### **2.9.4 Gopher**

Gopher was created at the University of Minnesota Micro Computer Workstation Network Centre in 1991. It is a menu driven programme that allows the user to click around the network of information servers of gopher hole on the Internet. Gopher was considered as the first user- friendly way to find information on the Internet. It combines the power of Telnet and FTP by displaying information in easy to use menus. Each gopher server has a main menu and a series of submenus. By clicking from one menu to another the user can search for information, until the required information is accessed. Many sites, primarily at universities, have adopted the gopher server software, and have used it to create links to their anonymous FTP servers, as well as to text-based information, images, sounds and even movies (Caden0, 1997).

Information in gopher space can be any of the following ;

- Another menu (sometimes represented by a folder icon)
- A document, a graphic file, or a text file (sometimes represented by a documented icon)
- A search entry,(sometimes represented by magnifying glass icon)

- Pointer to a text based remote login (Telnet)
- A pointer to a software gateway to another service (Usenet or FTP).

### **2.9.5 USENET (Users' Network)**

USENET was started in 1979 in North Carolina (USA) as an experiment. This is used to create an electronic bulletin board to facilitate the posting and reading of news. At first, the University of North Carolina and Duke University were the two sites in USENET. During 1990's USENET expanded enormously. Today USENET is a system of discussion groups in which individual articles are distributed throughout the world.

News reader is the client programme to participate in USENET. Using the news reader, one can select articles to read, save article to a file, respond to any article of one's own. Each USENET site is run by a person called the news administrator. News administrator can be the same person who manages the system in some places. One important characteristic of USENET is the facility of Frequently Asked Question list (FAQs). FAQ is a document, maintained by a volunteer, that identifies and answers all the frequently asked questions for a particular newsgroup (Hahn, 1997).

### **2.9.6 Bulletin Board Service**

An electronic bulletin board service allows a person to participate in multiple discussion groups, where each group focuses on a specific topic (Comer, 2004). The bulletin board service allows an individual to:

- Select one or more discussion groups of interest.
- Periodically check to determine whether new items have appeared in a discussion and, if they have, read some or all of them.
- Post a note to the discussion group for others to read.
- Post a note that responds to an item someone else has written.

### **2.9.7 Archie**

It is a file searching system, developed at McGill University of Canada. There are lots of Archie servers around the net, each of which consists of a database of most of the files that are publicly available via anonymous FTP. Each

Archie server stays in contact with anonymous FTP archive sites all around the world and maintains an up to date composite index of their holdings.

### **2.9.8 Internet Relay Chat (IRC)**

Internet relay chat is a worldwide network for the real time text conversations. It is a public talk which can be used by anyone on the Internet at any time. It can be done either by typing messages back and forth or by actual voice conversation. IRC enables to hold a spontaneous conversation with a group of individuals or a person who may never physically meet.

Each IRC conversation is carried on a channel. Using the IRC client programme one can join the channel of one's own choice.

### **2.9.9 World Wide Web (WWW)**

World Wide Web or simply the Web is the most promising service through the Internet. It is an information system that links data from different protocols under one umbrella. It allows pages to be linked together so that one can jump from one to another in a continuous way. The World Wide Web can be described as a convergence of different concepts for presenting linked information dispersed across the Internet in an accessible way.

In March 1989 Tim Berners-Lee, a scientist at the CERN, proposed a new set of protocols for an Internet information distribution system to be used among various high energy physics research groups. CERN is an acronym for the original name of the organization, Conseil Européen pour la Recherche Nucléaire. CERN is the European Laboratory for Particle Physics, with headquarters in Geneva, Switzerland. Berners-Lee described what he was proposing as a 'Web' consisting of a 'Network of Links'. In May 1991, the World Wide Web was released for use at CERN. In August 1991, the WWW was announced on the global system of discussion groups, USENET. In January 1992, the first programme to access WWW was made available to the public via anonymous FTP. From that time onwards, anyone on the Internet can access the WWW. Savola (1995) defined WWW as a 'Wider-area hypermedia information initiative.

The major reasons for accessing WWW are:

1. It is easy to use, and
2. It is easy to create own web information to share with people all over the Internet.

For the continued development of WWW standards, a consortium of organizations was formed, called the W3 Consortium. This consortium is led by MIT (Massachusetts Institute of Technology), CERN and INRA (The French national Institute for Research in Computer Science and Control).

**The prominent characteristics of the WWW are:**

1. It is a multimedia information system. It has the ability for displaying objects of non- textual types and for preserving the unique look-and –feel of objects emanating from different sources.
2. It is highly interactive due to the hypertext links within the body of information.
3. The Web is global in nature by permitting the unrestricted dissemination and use of sets of information of all types.
4. WWW has got a degree of user-friendliness in its interface.

### **Web Page**

The contents of a single file of hypertext is called a web page. Web pages are the logical units of hypertext. A web page may be only a few lines or it may so large as to contain many screenfuls of information, ie. a web page can be any size at all.

### **Home Page**

Home page is the main page of a particular web site. That is, home page is the starting page that is displayed when the user access the WWW. The homepage is designed to have links to the various documents on the site.

### **Web Sites**

A Web site is the location of published hypertext content. That is when a web server is connected to the Internet and has information to distribute, it becomes a web site.

## Uniform Resource Locator (URL)

URL is the standard method of encoding the location providing access to information with regard to resources across multiple information systems, on Internet. It contains three parts- the type of protocol, that is used to fetch the documents, followed by the computer site where the document is stored, followed by the directory path on the computer to the actual document. Every item put on the web has a unique address. For example to get the policies on the use of internet, the URL is:

<http://info.isoc.org/home.html>

Here, http is the name of the protocol,

-*info.isoc.org*: In this, *org* denotes that the domain of the type organization in USA as there is no mention of any other country code. The part *isoc* stands for the organization, Internet society and *info* denotes the particular computer in *isoc*.

-*home* is the directry path on the computer to the actual document,

-*html* indicates that it is a HTML document.

URL is very useful to code all the information needed to find any document on the network.

### 2.9.9.1 Hypertext and Hypermedia

The idea of hypertext was proposed by Vannevar Bush in 1945 for accessing information as it occurs in one's mind with links connecting associative information. He called it MEMEX and it became a reality with development of hypertext and hypermedia languages. Hypertext is a document which permits 'non-linear' access to information (Narasimhamurthi & Amba, 1995). The document contains programmed links to other documents and selecting the link results in the display of the linked document. We can select the path according to our own choice. This choice is just opposite to the conventional documents which follow a 'linear structure'. Hypertext, like all other types of data, is stored in files. Hypertext systems provide the facility for any two objects, or nodes, to be connected by a link that indicates the existence of a relationship of some other kind between the two. (Furner-Hines & Willett, 1995). The WWW first began as a Hypertext Publishing project at CERN lab with the intention of creating an easy method to access the research papers of the laboratory. The

formatting of raw documents and creating of links between them are made possible by the Hypertext Mark-up Language (HTML), which is an implementation of SGML.

### **2.9.9.2 Standard Generalized Mark-up Language (SGML)**

“A mark-up language is a formal set up of specification used to define information which can be added to the content of a document as an aid to processing it” ( Cady & Mc Gregor, 1996, p.222). SGML is a highly complex blue print for describing mark-up languages. SGML is a standard for defining a mark-up language to structure information in a document or set of documents. This standard is accepted by the International Organisation for Standardisation (ISO) as ISO 8879. SGML can be used to exchange information across hardware platforms and software applications.

Chandrashekhar (1996) described the Characteristics of SGML as follows

- SGML is a tagging language
- It handles logical structures
- It is a database language for text
- SGML supports multimedia and hypertext
- SGML with the present day tools enable users to view the documents using the WYSIWYG (What You See Is What You Get) concept
- SGML is a syntax for text processing style-sheets
- SGML allows coded text to be re-used in ways not anticipated by the user
- SGML is a document representation language for any architecture
- SGML is an annotation for any kind of structure
- SGML is a meta language for defining document types
- SGML represents hierarchies
- SGML is an extensible document description language
- SGML is a standard for communication among different hardware platforms and software applications.

SGML allows documents to move from one environment to another by separating the formatting the information from the content and structure of the document. The advantages of SGML include, cost control in data preparation,



hypermedia link behaviour, document control, ease in handling large document collections, unambiguous format enabling database storage and retrieval, multiple dynamic use etc. The web language HTML is a specific implementation of SGML.

### **2.9.9.3 Hyper Text Mark Language (HTML)**

HTML is an application of Standard Generalized Mark-up language (SGML) which is ISO standard 8879, specialized to hypertext and adapted to the Web (Lynch & Rose, 1995). This is a logical mark-up language which is used to create and recognize hypermedia documents. HTML files include both control information and content which together describe the appearance and the content of Web pages. It allows the authors to use tags to define the structural features of documents such as titles, headings, location of hypertext buttons and Uniform Resource Locators (URLs) of their targets. HTML documents can be identified with a suffix *html*. in Web page, links can be included anywhere marked up by HTML. To create Web pages, one should know HTML or procure a programme that generates HTML files.

### **2.9.9.4 Hyper Text Transfer Protocol (HTTP)**

HTTP specifies the transfer of hypermedia files from the WWW servers to the computer. The software called HTTP server is used to store and transmits WWW documents in a computer. The response of a network when a hyperlink is activated is specified by HTTP.

### **2.9.9.5 Web browser**

“A browser is a computer programme that provides an easy-to-use interface for scanning or browsing files on the Internet and transferring them to computer” (Fry & Paul, 1995, p.17). It is a client software programme that access content from an Internet server and assembles it in the form of a document, which is seen on the computer screen. Browsers effectively remove the need for the user to know commands to operate.

Fry and Paul have identified the following tasks of Web browsers

- Display document on the computer screen by translating their HTML codes into an easily read, interactive format, with text and in-line graphics. If configured for it, the browser can also be display external graphics and video images, in addition to playing sound files;
- Enables the user to navigate through a document and between documents by way of hyperlinks;
- Takes the user's instructions about where on the Internet to find a specific file, then goes to that location, negotiates the necessary protocols, and retrieves the file;
- Allows the user to custom design the view of a document, by changing colors and specifying font assignments for the various text elements of the document.

Browsers are of different types, some of them do not permit graphics or other media while others are multimedia-capable browsers. There are many Web browsers in the history of Internet browsers. Some of them are:

- LYNX: Lynx was one of the first Web browser, developed by Lou Montulli, Michael Grobe and Charles Rezac, at The University of Kansas. It is run on a character only environment.
- MOSAIC: It was developed by Marc Anderson at the University of Illinois's National Centre for Supercomputing Applications (NCSA) in 1993. It can run under the popular graphical user interface like Microsoft Windows, Macintosh etc.
- SLIP KNOT: This was developed by Peter Brooks for strictly character based interface of the Unix shell.
- CELLO: Cello which is a simple Internet browser for Windows was developed by Thomas R. Bruce.
- INTERNET WORKS: Internet works was one of the first Web browsers to support Microsoft's OLE (Object Linking and Embedding) version 2.0, which allows to create active, interactive links between different kinds of files (cadeno, 1997). This was created by Booklink, Inc. as an impressive full- featured Web browser.

- **NETSCAPE NAVIGATOR:** It considered as one of the popular Web browsers in the Internet world. It was developed by Netscape Communications Corporation in 1994. Netscape's features include the ability to load graphics files in waves, which makes pages load faster, and page caching, which increase speed. The facility to change color of the links that is recently used from their original blue to pink automatically helps the user to identify the visited links.
- **INTERNET EXPLORER:** This is a late entrant to the browser's field, provided by Microsoft. It is from the Microsoft and it is provided free of cost with Windows 98.
- **WIN WEB:** It is one of the new entries to the Web browser by E1 Net. This is ideal for less powerful PCs. It takes only 1 MB of hard disk space.

### **Searching techniques in the Web**

**1. Basic search :** In the Basic search, the user enters a word or words called 'keywords' or 'search terms', the search engine then looks through its indexes in the database for matches. After conducting the search, a list of sites that matches the requested search terms are produced as results.

**2. Advanced Search :** For refining the queries, advanced search techniques are used. In the advanced search, search engines are having the ability to search on more than one word, to confine the search to a specified field and to exclude words that are not required in a search by the user. Some of the advanced search techniques are described below:

- **Boolean Operators**

Boolean operators allow the users to connect the concepts of our search query in a meaningful way so that a user can retrieve relevant search results. "AND", "OR" and "NOT" are considered as the Boolean operators and it was developed by George Boole. The Boolean operator "AND" is used to narrow the search results to two terms combined with operator "AND". Between the two terms "+" is used in place of "AND". The operator "OR" is used to broaden the search results to any of the two terms combined with operator "OR". It retrieves pages that include any of the terms given in search query. But

the operator “NOT” is used to eliminate terms from the search results. It is used to exclude a particular term from the search results given after “NOT”.

- **Phrase Searching**

A phrase is a group of words that must appear next to each other in a specified order. To indicate a phrase, surround it in double quotation marks. Phrase searching can be used to increase the chance of retrieving relevant results.

- **Proximity Searching**

This allows searching of one term within ‘N’ words of another term, narrowing the search. Proximity operators are used to specify the relative location of words in a document.

### **Field Searching**

Web pages are made up of many parts, including title, URL, text of the page, links from the page, images on the page, etc. Some search engines allow these fields to be searched. The help section of search engines that support field searching would describe which fields can be searched.

### **Truncation and Wildcards**

Truncation is a technique that facilitates search for multiple endings of a word. The symbols such as “\*” “?” or “#” at the end of the word root is used to indicate a truncated search.

Wild cards can also be used for internal truncation. Internal truncation is used to search for words that may differ by one or two letters within a word.

## **2.10 Search Engines**

Search Engines are currently the most useful way to search the Internet. These are tools that keep track of many Web sites around the world. Through search engines one can search for particular items of information whenever the need arises. Search engines, catalogue the Internet sites and provide hypertext links to the sites. Each

search engine has its own unique way to access different databases. Rajkamal (2005) defines a Search Engine is a software with the following search features:

- (a) It maintains a huge database.
- (b) In the database, there are all the available words, titles, URLs, descriptions and comments, and a corresponding index.
- (c) Each index also specifies a brief description.
- (d) Each index also specifies a brief description.
- (e) The engine not only updates these indices regularly but also repeats the visit to previously visited URLs, pages and sites. The updating is by looking at new and also the deleted entries on the internet. A repeat visit is necessary. This is because there may be a change at these, either due to owner modifying the contents or de-registering. The engine may be using the filter and agents.
- (f) It provides the user a specific way or a "Search Form" to narrow, widen, or restrict the search to a desired site.

Search engine has three components enumerated below.

1. **The Robot or Spider** : The Robot or Spider are automatic computer programs that traverse the World Wide Web information space. This type of computer programs move from one web page to another by visiting links embedded on each web page it finds and in the process builds an index to visited web pages. This robot is resident on a host computer and uses the HTTP to retrieve files in all formats.
2. **The Database** : A Robot harvest indexing information from web pages that it visited in its database or catalogue that lists URLs, titles, headers, words from title and text, first lines, abstracts, and full text.
3. **The User Interface or the Agent** : This is a software program that accepts queries from users and searches them through the database consisting of index of millions of pages. The agent program matches the query with the database, finds hits and ranks them in order of relevance and arranged it to present before the users.

Some of the prominent search engines are described below:

- **Google**

Google was developed by Larry Page and Sergey Brin in 1997 while they were students at Stanford University and it was launched in 1999. Google headquarters, the Googleplex is located in Mountain View, California. Google supports Boolean searching, proximity searching, field searching, limit to file type, language and domain, character searching, numbers and number range searching. Results are sorted by relevance that is determined by links from other pages with a weightage given to authoritative sites. Google is considered as one of best known Web database and it is a good starting point for Internet exploration.

The web site address of Google is <http://www.google.com>

- **Yahoo**

Yahoo is the acronym of “Yet Another Hierarchically Officious Oracle”. It was started at Stanford University. Yahoo is built around a hierarchically arranged subject index and is backed-up with an image database, yellow pages, products and a news database. The results in Yahoo are sorted by a relevance algorithm. It supports Boolean searching, proximity searching, field searching, limits to language, domain, data, file type and country.

The web site address of Yahoo is <http://www.yahoo.com>

- **Alta Vista**

This search engine was developed by Digital Equipment Corporation (DEC) in 1995. It navigates the Web by using multiple spiders (automated computer programmes to create database) that systematically search and index Web sites. In Alta Vista, every word on the Web page is indexed. Thus, this search engine has tremendous indexing depth. ‘Live Topics’ is one of the unique feature of Alta Vista. Live Topics analyze the result and group common words on the pages into categories. The user is then prompted to search the database again, including or excluding these common terms.

The web site address of Alta Vista is <http://www.altavista.com>.

- **Excite**

It was considered as the 'all-purpose' search service on the Web. It reviews selected sites to provide a subject directory, city information, current news and other information. Excite uses 'Intelligent Concept Extraction' to analyze a site for determining key words for indexing. It does this by searching for concepts instead of keywords, using an algorithm to look for themes in a page and to find relevant concepts on a page.<sup>28</sup> To refine a search Excite has a feature called 'More Like This' link with each entry. When the user presses this button, Excite takes the key words from that database entry and re-searches the database for those terms, and thereby the search is refined.

The web site address of Excite is <http://www.excite.com>

- **Lycos**

Lycos, 'catalog of the Internet' is one of the earlier search engines on the web.<sup>27</sup> It was developed by Centre for Machine Translation at Carnegie Mellon University in 1994. Lycos indexes the titles, headings, subheadings, first 20 lines and the one hundred most 'weighty' words in a document. In Lycos, there is a provision for accessing related subject area by a button marked 'Related Sites' on the search results page.

The web site address of Lycos is <http://www.lycos.com>

- **Web Crawler**

Web Crawler was launched in 1994. It uses innovative meta search technology to search the internet's top search engines such as Google, Yahoo etc. This meta search technology highlights and uses the strengths of major search engines to deliver more relevant and comprehensive results. It has also the feature of further searching based on pre-set search terms from the subject catalogue.

The web site address of Web Crawler is <http://www.webcrawler.com>

- **Magellan**

Magellan has a hierarchical directory which is similar in structure and form to Yahoo. Magellan was named for Ferdinand Magellan, the Portuguese explorer. It has

a simple one line entry that allows user to add the search capability to their own page and also provides ratings and reviews of web sites.

The web site address of Magellan is <http://www.mckinley.com>.

## **2.11 Electronic Publishing (EP)**

Electronic Publishing can be termed as the fusion of electronic, computer and communication technologies with publishing. Electronic Publishing is defined as a process for production of documents containing text, graphics, pictures, tables, equations, etc. with the assistance of data processing system. Computer aided/ assisted publishing is the synonym for Electronic Publishing. In EP, the manuscripts are submitted in electronic format, edited, printed and even distributed to readers with the help of computers and telecommunications. For Electronic Publishing, the capabilities of the electronic media such as motion, sound and interactive features etc. are fully adopted. The exponential growth in the volume of published information, difficulty in retrieving information from libraries due to the literature seepage and scattering, the need to control and provide access to ever increasing volume of information, the faster rate of increase in the costs of raw materials used in publishing leading to the escalation of manufacturing costs of books and journals, the need to reduce the time required in conventional publishing, and the realization of the potential and unique features of electronic media are some of the reasons for shifting the emphasis from conventional publishing products to databases of indexing/abstracting services. American Chemical Society (ACS) was the first professional association bringing out scholarly periodicals in June 1983 over Bibliographic Retrieval Services (BRS).

### **Challenges of Electronic Publishing**

Mutula and Wamukoya (2007) identifies some of the challenges of Electronic Publishing. These include, but are not limited to

1. a lack of standardized way of finding information about new publications;
2. most publications are not covered by legal deposit laws;
3. the user may take time moving from one URL to another before identifying the required information;



4. current search engines are not sufficiently selective and may retrieve unnecessary information, thus increasing the burden on the user in attempts to get the relevant information;
5. Web addresses can be dynamic and volatile, complicating access to resources where addresses have changed;
6. should the individual responsible for maintaining a site stop updating it, the information will eventually become out of date and less useful;
7. internet access is not yet ubiquitous, therefore publications on the Web are restricted to those with internet connectivity;
8. accessing resources on the web requires training and access to the requisite equipment.

### **2.11.1 Electronic Journals**

Any serial produced, published and distributed through electronic networks is called Electronic Journal. Electronic Journal is a full text delivery system and differs from conventional bibliographic databases available online. In short, Electronic Journals are a new breed of journals for which the information is available in a digitised form over a network.

Using electronic media all the aspects of publishing such as preparation, refereeing, assembly, distribution and accessing can be performed. Using a computer, the author writes at his/her end. Through E-mail or teleconferencing, an article can be authored by more than one author. After completion of the article, it is transferred from the author's domain to the publisher's or editor's domain by way of E-mail. There the editorial processing is carried out. After evaluating by referees, these reviewed articles are then processed further based on the final status. Once accepted for publication, the article will be ready to the users to access it. The paper can be accessed issue wise by the users. Arrangements also can be made for sending periodical updates of papers automatically by matching the subject interest profiles of the users. Keyword based search facilities and hypertext features are provided for ease in search and retrieval.

### **Advantages of Electronic Publishing**

1. Minimises the time compared to publishing on paper, ie. the time lag in submission, refereeing, revision, editing, composing, printing, binding and forwarding.
2. Streamlines updates process and promotes availability of accurate documents instantaneously.
3. It is free from the restrictions on the length of the paper imposed by scholarly journals.
4. Reduces distribution and storage overhead. Multiple access and access through local networks becomes easy.
5. To access and retrieve relevant articles, a good number of search engines are available.
6. Allows media enhancement of existing reference materials with sound, animation and video.
7. Error reduction in production process.
8. Increases user effectiveness and productivity.
9. E-journals have solved many problems of libraries such as space, shelving, missing issues, missing pages and cutting of the pages.
10. Alerting the users regarding the publication of new issues and articles of their interest becomes easier in electronic media.

### **2.12 Issues in Internet**

Internet is a virtual sea of knowledge which contains files, documents, images etc. It is a co-operative organization and no one is in-charge of the Internet. There is a code of conduct ie. social norms and guidelines that are to be followed irrespective of users when navigating through the Internet or participating in discussion groups. This code of conduct is called Netiquette.

#### **2.12.1 Hacking, Worms and Viruses**

Ever since the Internet spread its wings, many software programmers have tried to dip into data flowing through its channels and trap what was not intended for them. They are called Hackers. They have the ability to manipulate the data. Interception is the processes of copying the messages that are transmitted through

Internet by unauthorized parties without the knowledge of the sender or recipient. This is a criminal act particularly when it comes to the hacking of databases of banks and financial institutions.

Two type of programmes that cause problems for Internet users are called Worms and Viruses. A Worm is a programme that goes from one system to another on the Internet. At each stage it makes multiple copies of itself, each running on a system. This is harmful for the system resources and may slowdown a system so that nothing else can be done. A Virus is a piece of code or instructions that attaches itself to existing programmes. A Virus erases files from the disk or it may carry out the added instructions while executing the programme, sometimes the virus announces only its presence. Being part of an executable programme, a virus moves from system to system. Using the virus scanning programmes, the user can check the programmes before they are loaded into the system. Always it is better to make sure a backup copy of the files are stored.

### **2.12.2 Intellectual Property Rights and Copy Right**

Numerous files, documents, images and other types of items are available on the Internet. These can be viewed, copied, printed, downloaded, saved in a file or passed on to others. Many of these items do not exist in physical form and even then the question of Intellectual Property Rights arises. The ease of copying, coupled with sheer number of potential electronic texts, creates unparalleled opportunity for plagiarism (Cronin). A number of laws and agreements are there throughout the world in this regard. The right to copy or duplicate materials can be granted only by the owners of the information. Many of the documents on Internet are copyrighted and given permission for disturbing the documents in an electronic form, provided it is not sold or made part of some commercial venture.

### **2.12.3 Encryption and Fire wall**

The data transferring from one computer to another through Internet is through Packet switching. In Packet switching, the packets making up a message may pass through different systems before reaching the concerned destination. During this process, many systems in the midway may be able to look at the address of the

destination and also it could be able to examine the contents of the message. To avoid this interception and examination, Encryption is applied.

Encryption is the activity of putting a message into an unreadable form. Using the secret code the characters in the message can be changed by substitution or scrambling. The secret code that is used for substitution is called a key. The message cannot be read unless the code and method of encryption are known. Many messages are encoded by a method called Public Key Encryption. With Public Key Encryption there are two keys; one Public and the other Private. Every user has a Public key and it is known to others. To send a message to a user, using the recipient's Public key the message is encrypted. Using the Private key of the recipient, the message is decoded into the original form. The Private key is kept secret.

*Pretty Good Privacy* is one of the software for public key encryption. The complete account of *pretty Good Privacy* can be got through the anonymous FTP;

*ftp: // ftp. Netcom.com/ pup/mp/mpj/get pgp.asc*

*ftp:// ftp.mwc.edu/internet.info/encryption/ get pgp.asc*

However, encryption does nothing to keep digital pests and hackers out. To accomplish this goal, Fire wall is introduced. The firewall can act as early warning system against unwanted intrusion or attack and permit manual review, message journaling, attachment filtering, source routing and two- network multilevel connectivity with unique password scheme (Ackermann, 1996). Firewall is a combination of hardware and software that separates a local are network (LAN) into two or more parts for security purpose. It is a set of related programs, located at a network gateway server that protects the resources of a private network from users of other networks. All network connections to and from the institutional network pass through the firewall, which acts as a gatekeeper to give access to valid requests and blocks out invalid and unauthorized request and transmissions.

## References

- Ackermann, Ernest (1996). *Learning to use the internet : An introduction with examples and exercises*. New Delhi: BPB Publications.
- Aptagiri, Devika V. (1995). Information Super Highway : The internet. *ILA Bulletin*, 31(3-4), 79-84.
- Cadeno, Nancy (1997). *The internet tool kit*. New Delhi: BPB Publications.
- Cady, Glee Harrah, & Mc Gregor, Pal (1996). *Mastering the internet*. New Delhi: BPB Publications.
- Carl-Mitchell, Smoot, & Quarterman, John S. (1993). *Practical internet working with TCP/IP and UNIX*. New York: Addison Wesley.
- Chandrashekhar, S. (1996). *Electronic publishing with SGML*. IN: Proceedings of the SIS conference. Jan. 18-20, New Delhi: New Age International.
- Comer, Douglas E. (2004 ). *The internet book : Everything you need to know about computer networking and how the internet works*. 3<sup>rd</sup> ed. New Delhi: Prentice Hall.
- Cronin, Blaise (1997). *The Internet. World Information report 1997/98*. Paris, UNESCO.
- Fry, Andrew, & Paul, David (1995). *How to publish on internet : a comprehensive step-by-step guide to create expression on the world wide web*. New York: Warner Books.
- Furner-Hines, Jonathan, & Willett, Peter (1995). The use of the world wide web in UK academic libraries. *Aslib proceedings*, 47(1), 22-28.

Hahn, Harley (1997). *Harley Hahn's the internet complete reference*. 2<sup>nd</sup>ed. New Delhi: Tata Mc Graw Hill, 1997.

Lynch, Daniel C., and Rose, Marshall, T. (Eds). (1995). *Internet system hand book*. New York. Addison Wesley.

Mutula, Stephen M., & Wamukoya Justus M. (2007). *Web information management : A cross disciplinary textbook*. Oxford, Chandos,

Narasimhamurthi, Natarajan, & Amba, S. (1995). A resource for teaching internet access. *DESIDOC Bulletin of Information Technology*, 15(6), 20-25.

Nicholson, Scott (1997 ). Indexing and abstracting on the world wide web : an examination of six web databases. *Information technology and libraries*, 16(2), 74-79.

Raj Kamal (2005). *Internet and web technologies*. New Delhi: Tata Mc Graw Hill.

Savola, Tom (1995). *Using HTML*. New York: Rolan Elgey.

Sinha, P.K. (1992). *Computer Fundamentals*. New Delhi: BPB Publications.

Tanenbaum, Andrew S. (1997). *Computer networks*. New Delhi, Prentice Hall.

## Chapter III

### Review of Literature

The first step in any investigation involves reading what other people have studies about the subject under study. In order to get an idea about the past studies conducted in the internet utilization and academic activities of faculty members in the universities an exhaustive literature search was carried out. These relevant publications will give an idea about what has already done in internet utilization, how these analysis are carried out and what methodologies have been followed. Hence an exhaustive literature search survey has been carried out and important articles from journals, conference proceedings, chapters in books and information from internet sources were collected. In this chapter, review of related literature published in the area of internet utilization is presented in chronological order, which will give an overview of the research conducted in this area earlier.

**Trivedi and Joshi (2008)** conducted a study among faculty at Pramukhswami Medical College and Shree Krishna Hospital of H M Patel Centre for Medical care Education and Research, Karamsad, Gujarat, India. The survey included 194 health care professionals of which 116 were males and 78 were females. Questionnaire was the instrument used for the survey. More than three-fifths of respondents reported that their level was “just conversant,” with 30 percent “well conversant.” Most of the respondents had some computer knowledge, more than three quarters had no formal computer training. The faculty members use computers to access online journals, teaching materials, dissertations and for communication through e-mail. The purpose of searching was for obtaining health information for students and patient care. The study opined the need for formal training for all levels of staff. Library professionals on campus could take the initiative to improve and expand internet searching and use. Librarians might prepare a list of subject websites, data useful to researchers, link to free online databases and place them on the library website.

**Biradar and Kumar (2008)** investigated Students and Faculties' searching behaviour and the internet use of search engines for retrieval of scholarly information. The study investigated the use of search engines, use of popular search engines, factor that influenced on search engines use, use of search strategy for information retrieval and also to know the methods of learning search strategy by students and faculties in the university background. 120 questionnaires were distributed to students and faculties of Kuvempu University, Shimoga. Of these, 100 users filled and returned the questionnaires. Equal number of students and faculties and also equal proportion of science and social science department's respondents were considered for the study. 96% of faculties and 76% of students used internet for different purposes. Many of the respondents reported that the information available on the Internet had proved to be a great asset and they responded that with internet resources their professional competence were improved and they were abreast with the latest information. According to the frequency of Internet use a large number of faculty members frequently used Internet for their academic work regularly. The major purposes of internet were Study/Teaching, Research and sending e-mail.

The most popular used search engines by students and faculties were Yahoo and Goggle. Search engines such as Alta Vista, Hotpot, Lycos, Euroseek, Excite, Northenlight were meagerly used by the users. The factors influenced on the use of search engines were search engines popularity, more information and user friendliness. The respondents adopted help messages in the search engines, help from friends and reading books were used to learn the search strategy for internet information. The study found that majority of the users was not aware of different search engines except Google and Yahoo. For improving the use of search engines, Library authority should take initiatives to improve the information searching on the internet among users by providing formal training and prepare lists of search engines and their techniques for retrieving relevant information.



A joint study was conducted by **Ansari and Jilani (2008)** among the students of the Delhi university during the academic year of 2006-2007. The objectives of the study were:

1. gender ratio among users of the internet.
2. level of use of existing internet services.
3. purposes of use of internet services.
4. most frequently used search engines by the students.
5. most common service used by the students.
6. most favourite job related sites.
7. problems faced by the students while using internet services; and
8. views of the students regarding the replacement of library by internet in the future.

Due to slow speed in the departments, users preferred to use the internet facility in the Delhi University Computer Centre. 100 questionnaires were analysed. Among the respondents 32% were undergraduates, 62% post graduates and 6% research scholars. In the gender wise distribution, 63% were males and 37% were females. The investigator found out that for girls there was internet facility in the ladies hostels and therefore they preferred to access the internet from the hostel. Regarding the timing is concerned among undergraduate students 22% used the internet for about 30 minutes in a day, while 68.8% spent between one-two hours, 12.5% between two-four hours and about 0.3% spent more than 4 hours on the internet. Among the post graduate students, the corresponding figures being approximately 24%, 58%, 13% and 5% respectively. In the case of research scholars 33.3% of research scholars, they spent less than 30 minutes and an equal percentage between one-two hours while 16.6% used between 2-4+ hours. From the timing of using internet it was clear that the largest number of users in all three categories used the internet between one-two hours. Internet explore was the more widely used browser.

The purpose of using internet by Undergraduate students and PG students were for academic achievements and competitive examinations. But research scholars were using internet for research purposes. E-mail, WWW and Chatting were the most commonly used internet services by the students. The percentage of downloading the

software steadily increased with the level of education ie. it was least among undergraduate students and highest with research scholars. Trial and error method and guidance from friends were the mode of learning internet skills by the respondents. The most preferred job related site for UG and PG students was naukri.com and for research scholars it was carrerage.com. According to respondents search engines were the sources for providing information for various sites. Google, Yahoo and Alta Vista are the most popular search engines for students in that order of preference. Slow speed was the major problem faced by the respondents. A good number of respondents indicated that internet was more informative, less expensive and time saving in comparison to conventional documents. All the respondents were having a feeling that the internet could help them to building up their careers.

**Biradar and Kumar (2008)** conducted a study of search engines used by research scholars and faculty members of physics departments in the universities of Karnataka state. The objectives of the study were use of various search engines, frequency of use of search engines, factors that influence use of search engines, use of search strategy by Physics research scholars and faculty members in the universities of Karnataka State. The respondents included all the 189 research scholars and 103 faculty members in the department of physics in six universities in Karnataka state and the Indian Institute of Science, Bangalore. The analysis of the study revealed that most of the respondents could be considered as internet users. Majority of the respondents responded that they had used search engines to retrieve information on the internet and only a few of them mentioned that they have not used search engines. Google and Yahoo were the most frequently used search engines followed by Altavista, Lycos and Hotbot. The search engines such as Excite, Northern Light, Euroseek and Infoseek have not been used. 84.3% of the respondents were aware of search strategy of different search engines. The help message in the search engines home page helped the respondents to study the search strategies followed by the using books and articles. The factors that influenced the use of search engines were popularity of search engines , more information can be accessed, easy to connect on the Internet, user friendly etc. The investigators put forwarded a suggestion to librarians that, librarians should organize workshops on use of search engines and also assist the users at the time of searching literature using search engine.

**Riahinia and Azimi (2007)** carried out a study among the females of Tarbiat Moalem University in Tehran. The objectives of the study were use of internet among females, their favorite sites, issues and their attitude towards using the internet. The population includes all females affiliated to TMU, grouped into three categories: academic staff, master and doctoral students, and staff members. A quota sampling was conducted in which 25 percent in each category of the population were asked to complete the questionnaires. The response rate was from 80 respondents. This number included 40 students with an average age of 26, 21 faculty members with an average age of 50 and 19 staff with an average age of 41. Among the respondents 40% used the internet an average of one to five hours per week and 9% use 5-20 hours per week of internet services. The average use of internet through all three groups was just over two hours per week. 50% of students, 26% of faculty members and 24% of staff had used the internet resources and services. Those who were using women-oriented web sites constitute 18% of faculty members, 47% students and 35% of staff. Concerning the use of internet per week and its relation to safety it was found that as the use of the internet increases the feeling of security decreases. Regarding the different kinds of internet services used by women, it was clear that e-mail had the highest use followed by new discoveries, search for resources and gaining information. Women were interested in e-mail because of their very nature of secrets and whispered talks. In the academic environment women would keep their favorite style of writing by e-mail.

The problems encountered by the respondents are low speed connection, lack of facilities, language barriers and the high costs of scientific resources. From the study, students' use of internet had been more than other categories, while staff members were ranked at the bottom. This was due to students using internet for their preparation to class assignments, search for resources and review for their dissertations. When the study included the variable of age of respondents, it would be clear that as the respondents ages grew the average use of sites devoted to women fell and vice versa. This may come from the assumption that as the females grew older they would be less interested in romance and fantasies and special issues related to women's characters and responsibilities. In this study respondents did not use the internet for seeking friends because they feel insecurity in cyberspace and the chances

of harassment. The study concluded that in Iran this was the time for thinking a digital world with more women's participation and a safer electronic place having mutual relationships and move toward for further discoveries.

**Madhusudhan (2007)** conducted a study among the 60 science and technology research scholars at Central Science Library, in the Delhi University Library system. Central Science Library has more e-resource, journal databases and full text scholarly electronic journals. The library have 30 computers with free internet services. The major purpose of the study was to find out the current trends in information search through internet and the problems while searching internet information by the research scholars. The other objectives of the study were:

1. To study the role of internet in information dissemination and transfer;
2. To find out the research scholars' awareness in using internet resources;
3. To assess the use of internet as an information source by the research scholars in the fields of science and technology;
4. To identify the problems faced by the research scholars in searching of information through internet; and
5. To suggest ways and means for the better utilization of internet resources.

The response rate of the study was 85%. Tools used in the study were questionnaire, observation and informal interview using stratified method. 66% of the respondents visit the library for e-journals and databases. The mostly used databases were Sci Finder scholar, Scopus abstract and citation databases and the e-journals were IEEE & IEL online. During library visit research scholars tend to spend more time on the internet due to free access of internet. Those who were using internet in CSL had some idea about the internet and its services. Concerning the frequency of internet use 70% of research scholars used it daily, 16% used it more than two or three times in a week, 12% used once a week and 2% used occasionally. Through search engines majority of the research scholars accessed information from internet and the most preferred search engine was Google followed by Sirius, Yahoo, Altavista, Lycos, webcrawler and Infoseek. 74% of the research scholars preferred keyword searches for browsing information. The second preference was for the author searches followed

by subject, journal title and title of the article. The least preferred search technique was the date of publication.

The most preferred advanced search technique among the research scholars was field searching followed by phrase search, Boolean search and truncation respectively. For internet searching 57% of respondents sought help from the library staff. From this it was cleared that research scholars were not being systematically taught to effectively search the information on the internet. 51% of the students strongly recommended that the internet had made research work easier for them. A vast majority of the respondents used the internet for communication via e-mail followed by browsing through the web. FTP was the least used internet service by the research scholars. 98% of research scholars were more concerned about easy to use downloaded materials for their research. 68% of the respondents had the opinion of use of the internet had created high dependency value on their research work. 47% of the research scholars had expressed full satisfaction with internet services. The problems enumerated by the respondents were low band width, retrieval problems, insufficient time and teaching. The suggestions made by the respondents such as provide more computer with internet facilities, more journals should be converted into electronic versions and high bandwidth provision. CSL should design and develop Multimedia presentation (flash) for internet resources. Entertainment sites should be locked in the CSL internet facilities, redesign CSL website with active links and content and also user friendly to access online resources.

**Saravanan and Mary (2007)** conducted a study of teacher's approach to Internet and Online Information sources. The objectives of the study included:

1. To understand the purposes for which the college teachers are using the Internet.
2. To know the frequency of using internet sources by the college teachers.
3. To study the teacher's approach to the Internet and online information resources.
4. To analyse the search strategy adopted by the college teachers when browsing internet and online information resources.
5. To identify the most preferred search engine used by the teachers when accessing internet sources.

The study was based on a sample of 60 respondents who had participated in the Orientation Course and the Refresher course in English at Academic Staff College, Kariyavattam, University of Kerala, November 2005. The investigator had adopted survey method for data collection using stratified random sampling method and descriptive statistics had been used for the interpretation of the data. The analysis showed that the purpose of using internet sources by the majority of the college teachers was for the preparation of classroom teaching and the average time spent for accessing internet information resources were less than 5 hours in a week. Teachers were depending more on traditional source than e-source. Their approach to internet resources were similar to traditional sources and the order of accessing internet information were abstracts, content summaries, judgment about content, bibliographies and various links. Most preferred search engine used by the college teachers was Google and the most preferred format of information was PDF. Most of the teachers were following simple search. Only 49% of the college teachers had quality awareness towards internet information resources. The study also found that knowledge of college teachers towards various quality parameters such as filtration, currency of information, supporting system, copyright and reliability of information were poor. The financial assistance from the UGC for computer and internet facilities had not been properly utilized in the colleges. The study concluded with the following suggestions:

1. Compulsory computer literacy to all the teachers.
2. Formal training on how to browse or download from the internet and online sources.
3. Seminar and workshop may be organized periodically for the college teachers both regional as well as at national.
4. In IR oriented courses part of the curriculum may be centered on step by step of browsing and conduction search strategy and how to filter the information may be included.
5. Day to day activities of the teacher in a classroom must be centered on the quality of internet information sources.

The study concluded with a point that it was the responsibility of the UGC and the Head of the institution to utilize the fund for computer and internet facilities properly.

**Khare et al, (2007)** conducted a survey to study the pattern of internet use of Ph.D scholars of Dr. H.S. Gour University, Sagar, Madhya Pradesh. The objectives of the study are:

1. To know the purposes of using internet by research scholars,
2. To ascertain the knowledge of users about the internet resources,
3. To identify the popular search engines,
4. To determine the level of their satisfaction with the services, and
5. To suggest ways of providing better internet services to users.

The study also formulated the following hypotheses:

1. In the present IT age the research scholars would be aware of internet resources and services and hence extensively use internet for research purpose.
2. Internet being a source of information would be of immense help to Ph.D research scholars.
3. In present information age, internet connectivity would be provided by the central library and the departments of the university.

Questionnaire was the methodology adopted for the study. A sample population for the study included 100 Ph.D scholars with 10 scholars from each of the ten faculties. From the study it was found that 66% of research scholars use internet and 34% were non users of internet. The purposes of the users of internet were educational, job search, entertainment, communication and business. E-mail was the most commonly used internet services and there were no users of TELNET and USENET service. Google, Yahoo, Web crawler were the most used search engines. The difficulties faced by research scholars in using the internet were technical problems, language related problems and network related problems. Regarding the satisfaction with the information retrieved from the internet, 42.42% users were of the view that retrieved information was not pin-pointed, 30.30% believed that information is sufficient, 19.7% believed that is not fully sufficient and 7.58% users believed that

retrieved information from the net was not sufficient for their research purpose. The reasons for the dissatisfaction of internet services in university library were computer system related problems, feel access time was slow, lack of adequate number of computers and low speed of connectivity. The hypotheses formulated in the study were verified and found that the first two hypotheses were satisfied with the result of the usage of 66% of the respondents for research purposes. The third hypothesis was also satisfied as internet connectivity was provided by the Central Library of the university and the teaching departments. The investigators had put forward some suggestions such as development of internet awareness especially among female Ph.D scholars, short training, provide adequate number of computer in each department with internet facilities and for language problem a short course in English also be provided.

**Shihab (2007)** investigated a survey of internet use among the faculty members in library profession and librarians in different parts of Kerala with the following objectives.

1. To find out the extent of the use of internet services among library professionals.
2. To identify the main internet resources and services utilized by library professionals.
3. To find the different purposes for which the internet is being used among library professionals.
4. To identify the search engines and browsers used by library professionals.
5. To find out the problems faced by the respondents while using the internet.

Among the 120 respondents 90 library professionals had responded. Out of 90 respondents only 43% were using internet daily. 19% used the internet 2-3 times a week and more than 12% used internet once in a week. But most of the library users were aware of internet and its resources. 83% of respondents were having e-mail id. Concerning the amount of time spent on the internet, 53.85% used for 0-1 hour, 26.9% for 2-4 hours, 3.8% for 5-6 hours and 3.8% for 7-9 hours in a week. Only 11.5% have using the internet more than 10 hours in a week. Among the library professionals most frequently used location was their offices. The purposes of using



internet by them were for information search, academic purpose, and communication purpose and for entertainment purpose. The most preferred internet resources were e-journals and e-books followed by conference proceedings and technical reports. Google was the most widely used search engine followed by Yahoo, Alta Vista and Lycos. The problems faced by the library professionals while internet using were slow access speed, irrelevant information, lack of quality information, overloaded of information, more time in downloading PDF files and privacy problems. The study concluded by suggesting to the library professionals to improve the skills required for information searching on the web and thereby the library services could be supplemented by the internet services to the users in getting right information at the right time.

**Cheiemek et al, (2007)** conducted a study among the users from five institutions in south western Nigeria. The population consisted of 250 persons stratified into 3 groups; lecturers, undergraduates and Post Graduate students from the above five institutions. Out of 223 returned questionnaires 200 were selected for research purposes. The objectives formulated in the study were the level of usage of internet and formal library facilities for research purposes in Nigeria and whether these facilities were complementary and provide equal satisfaction and what were their discrepancies. Regarding the purpose of using academic libraries, 58 respondents were using for general reading, 60 for preparation of examination and 82 for research purposes. Concerning the purpose of using internet 61 used for general reading, 50 for preparation of examination and 89 for research purposes. Among the 200 respondents 177 respondents were using internet often. 165 respondents were using internet at cyber café, 25 at office and 10 at home.

From the analysed data it was clear that there was no perceived significant difference in staff efficiency and ease of use of facilities in academic libraries and online environment. However there was significant difference in users; perception of speed of access to needed research materials, availability of current and up to date materials, cost of access and distractions within the facilities. The study suggested that academic libraries should be equipped with modern infrastructure and made provision in the budget for training programmes and reduce internet costs across the country.

The investigators opined that Librarians must be trained in the use of current technologies to them in the discharge of their duties.

**Mahajan (2006)** has conducted a survey to study the use of the internet by the researchers at Punjab University, Chandigarh in all the three field of knowledge-sciences, social sciences and humanities, so as to determine its influence on their academic life. 200 questionnaires were distributed, 80 researchers in sciences, 80 to researchers in social sciences and 40 to researchers in humanities. 80% of science researchers and 90% of social science researchers used internet at their respective departments. But in the case of humanities researchers cyber cafes were the internet accessing point. 90% of science, 30% of social science and 5% of humanities researchers use internet for academic purpose. The study revealed that researchers in sciences are more positive about internet use and its impact on their educational needs. All the science researchers had gone online to access information from the e-journals that were available through the university library whereas only 40% in the social sciences and 5% in humanities were using online journals. Researchers use electronic resources more than paper resources as they were confident to find resources through internet rather than paper resources. The other purposes of using internet were document delivery services, online job seeking, publishing research papers in e-journals etc. The majority of researchers in all fields who used internet for accessing information use search engines like Yahoo, Google, Infoseek and Altavista. Most (99%) of the science researchers and 50% of the social science researchers agreed that internet had a positive impact on their study and research, while researchers in humanities did not agree with the above statement. According to Mahajan, for the maximum utilization of internet resources, firstly the academic staff should encourage the use of electronic information sources and the librarians should provide proper training in the use of online information sources.

**Al-Ansari (2006)** investigates the patterns of internet use among faculty members at various colleges of Kuwait university. The objectives of the study were patterns of internet use, purposes for using internet resources, the influence of internet on research and teaching, search engines used by the faculty members and difficulties faced by the faculty members. The study was limited to four colleges of Kuwait

university, ie. Sciences, Engineering, Social Sciences, and Arts. Due to their large number, it was decided to take half of the faculty members from each college, the sample came to 246. Questionnaire was distributed to the faculty members and the response rate was 62.6%. Out of 154 respondents 11 faculty members neither used a computer nor the internet. Because of this non use of internet by 11 respondents, data was analysed with the use of remaining 143 questionnaires.

Among the respondents 78.3 were males and 21.7 were females. By the age wise distribution 14.7% were 35 years or younger, 47.6% were between 36 and 45 years, 25.9% were between 46 to 55 years and 11.9% were 56 years or older. Most (64.7%) of the respondents above 55 years of age were professors and those having under 36 years age were assistant professors. 16.8% of the respondents have been using the internet for 11 or more years, 46.9% for 6 to 10 years, and 36.4% for up to 5 years. Assistant professors have been using the internet for longer years than other ranks and that the respondents with higher ranks seem to have started using the internet later. 25.9% of respondents spend 10 or more hours per week using the internet, 22.4% spend 7 to 9 hours, 18.2% spend 4 to 6 hours and 33.6% spend up to 3 hours. 51.7% of the respondents spend less than one hour per day using the internet. Self instruction was the most commonly used learning method of internet followed by assistance of colleagues and friends.

Regarding the use of internet sources, 93.7% of the respondents use e-mail, 83.9% use search engines and 65.7% use www resources. The least used internet resources are FTP and Gopher. Science and Engineering faculty use the internet as a communication and research information medium much more than Social Science and Arts faculty members. Engineering faculty members are the top users of the internet for searching software. The primary use of internet information is for research and publication and for personal interest and less so for teaching and class assignments. Regarding the preference of internet services, e-mail ranked 1, catalogs and databases ranked 2, e-journals ranked 3 and WWW resources ranked 4. The most popular used search engines are Yahoo, Alta Vista, Info Seek and Google in that order. Respondents reported that internet have had a very positive impact on the work of the faculty members. The major impacted areas are saving time and obtaining fast and up

to date information. The problems identified by the respondents are slow access speed, lack of time and lack of access to the internet from home. 69.2% of the respondents reported the need for training in advanced search techniques. The study concluded with some points of further research to measure internet use skills of faculty, staff and students in a more concrete manner so that different training packages can be prepared for various groups.

The study of **Kumar and Kaur (2006)** was to analyse the use of the internet among the teachers and the students of engineering college's three states of India such as Punjab, Haryana and Himachal Pradesh. The objectives of the study was to assess various aspects of internet use, frequency of internet use, methods used for learning internet skill, most frequently place of internet use, purposes for which the internet is used, use of internet services, ways to browse the information from the internet, problems faced by the users and satisfaction level of users with the internet facilities provided in the colleges. For selecting the sample, 30 respondents from each college taking at least five from each branch of each college under study. Among the five respondents, 2 were teachers and 3 were undergraduate students. From the above sampling technique 1980 respondents were selected. Questionnaire method was used for data collection and from 1980 samples, 658 teachers and 945 students were responded.

Majority of the respondents had been using internet an average for more than 2 years and most of them use it 2-3 times in a week. 33.7% of respondents used the internet for 2-4 hours a week and only 5.1% had used internet for less than one hour a week. College or work place was the most frequently used place for the respondents. Trial and error method was the most commonly used for learning internet skills. Guidance from colleagues, self instruction and training was also used by the respondents for learning internet skill. Internet was most commonly used for educational purposes and least used for entertainment purposes. The other purposes of using internet were research and communication. E-mail had been the most popular internet service used by 99.9% of the respondents. Next commonly used service was WWW. The other services were Search engines, Chatting, FAQs, FTP, Telnet, and BBS. Using of Archie and Discussion groups were very low. The problems of internet

for the respondents were slowness of network communication, slow access speed, difficulty in finding relevant information, overload of information on the internet, and the privacy problems. Most of the respondents used Search engines for browsing internet. The other modes for browsing internet are type the web address directly and use of subscription databases. When comparing internet to conventional documents, respondents opined that internet was time saving, more informative, less expensive and more useful than conventional documents. Regarding the influence of internet on academic efficiency, respondents reported that due to the availability of latest and instant access to information on the internet, dependency on internet had increased, research process expedited, and the professional competence improved. While dependency on internet increased the use of conventional documents had decreased. Only 33.1% of respondents are fully satisfied with the internet facilities, 33.1% were partially satisfied and 13.2% were least satisfied. A majority of the respondents were having the opinion that internet cannot replace library services and it can only supplement library services.

The study suggested improving internet services by increasing the timings of the internet services, providing more computers with latest internet specifications, more efficient technical staff and providing printing facility. The study also recommended putting academic news at the web sites of the colleges and display of important web sites in the notice boards.

**Adogbeji and Toyo (2006)** conducted a study to assess the level of internet usage among the academic staff of the Delta State University, Abraka to determine the impact of the internet on research. Among the 485 faculty members 20% were selected from the five faculties of arts, science, education, social science and medical sciences. The sample constituted 100 respondents. Questionnaire was distributed to the respondents and the response rate was 70%. All the academic staff in the study reported that they had access to the internet. 88.6% had access to the internet through cyber cafes. 41.4% of the academic staff had been using internet for about 1-2 years; 35.7% and 8.6% have been using it for about 3-4 years and less than one year respectively. Only 14.3% had been using the internet for five years or more. Most of the academic staff used the internet for E-mail, searching for research and academic

materials and for communication with friends and relatives. A good number (81.4%) spent less than 10 hours per week on the internet. This may be due to the cost of internet services and inadequate computers at cyber café. 97.1% of academic staff opined that the internet had made research work easier. Regarding the benefits of the internet browsing 92.9% of academic staff had benefited from the use of the internet through downloading of related information materials for research. 7.1% of academic staff were having the opinion that of internet benefited through making choice of research topic easier and ease the sending and receiving of mails. For research internet provided quick access to academic materials, ease of communication, ease of choice of work and access to relevant and up-to-date information. Regarding the impact of the internet on research 82.9% of academic staff revealed the fact that the use of the internet had created a great impact on their research work. Only 2.8% mentioned that they had not experienced any impact on research by the internet. Adogbeji and Toyo suggested that the university should set up an internet centre for staff with more access points and should organize formal training in internet. Next, the academic staff should change their orientation and attitude towards internet.

**Anunboi (2006)** conducted a study among 1200 students of Federal University of Technology Owerri (FUTO), Nigeria with a view to identify the rate and purpose of internet use by students in order to be well positioned to provide effective internet services to them. Questionnaire was randomly distributed to 1200 students out of which 67.6% were returned. The survey showed that 95.5% male and 90.4% female students had used internet. Internet centre and university were the commonly used place for internet access. Most (50.2%) of the students accessed internet only once in a week and only 3.5% used internet daily. According to Anunboi students used internet for the purposes such as entertainments and sports, academic purposes, correspondences and social and business purposes. The areas of academic activities these students focused on the internet included according to their responses are knowledge improvement, collection of materials for assignment and collection of materials for research, projects and assignment. The enumerated purposes were achieved through accessing and downloading academic material, access and downloading software, visiting other university sites and sending or receiving e-mails.

The recommendations marked by Anunboi are:

1. University libraries should install and provide internet services in their libraries and such services could be provided at subsidized rates and thereby reduce students the risk of searching for information outside the library. By doing so, libraries could generate funds and maintain its integrity;
2. Since university students use internet heavily, the use of library programme in universities should be reviewed to include the use of internet as a form of literature search;
3. The libraries which have installed the internet should embark on capacity building on staff who will use their knowledge of library operation to explore the internet and give adequate services to internet users.

**Hinson and Amidu (2006)** carried out a study among the final year students of Ghana's oldest business school to evaluate the level of awareness and utilization of the internet for academic research and learning. The objectives enumerated in the study were as follows:

1. The level of awareness of the internet among students and its various applications;
2. The level of access students have to the internet ;
3. Strategies adopted in locating information on the internet ;
4. Strategies adopted in locating information on the internet ;
5. The uses of the internet as a learning tool ;
6. The uses of the internet as a research tool.

The research instrument used was a structured questionnaire with both open and close ended questions. 240 students in final year were interested in filling questionnaire and out of 240, 180 usable questionnaires were received representing a response rate of 75%. 42% of the respondents indicated that they were introduced to the internet by friends/family members. The other sources of getting information regarding internet was from courses and self initiative. The factors that attracted to the internet by 69% of respondents were information convenience, educational use and the possibility of finding information. 48% of respondents reported that their lack of

skills in the use of the internet was the obstacle for using internet. Regarding the use of internet services for research 36% of respondents always use E-mail, 2% always use Telnet and 2% always uses Discussion groups. For learning, students used E-mail and WWW while for research they have used E-mail, Telnet and Discussion groups. 49% of respondents have used search engines, 7% used meta search engines and 40% students information gateways for locating information for their purposes. But one half of the respondents rarely or never used any sort of internet search/ retrieval tools for locating information and this is points to a need for training of internet.

The recommendations made by the investigators were urgent steps for providing more access points and orientation, mechanism for constantly upgrading skills of faculties, head of the departments and lecturers and ensuring continuous access to the internet would also help increase the level of awareness and use in research and learning among the students.

Lal et al, (2006) studied the use of internet among students and resident doctors of Maulana Azad Medical College, Delhi. Respondents of 449 were selected from 1<sup>st</sup>, 3<sup>rd</sup> and 5<sup>th</sup> semester of MBBS students, Post Graduate students and senior residents working in various specialties. Among the respondents 85.1% were observed as higher users of computers. 90.6% of respondents were aware of the internet café in the medical college campus. Post Graduate students and senior students were more aware than the UG students in the medical college. The major purpose of using internet were educational such as visiting websites providing information related to the medical field and this purpose was mostly among the PG students and the Senior residents. But surfing, chatting and entertainment were mostly among the UG students. Senior respondents used internet for preparing seminar and research work. Among the respondents who were using internet at internet café , 50.8% were dissatisfied with its service due to slow speed, and inadequate computers, out of order frequency was more, inadequate hardware and software of the computers. These dissatisfaction points at medical college cause great use of internet at home by 62.4%. The study suggested is providing training as how to use internet effectively which will encourage the students to use internet.



**Badu and Markwei (2005)** conducted a survey among the randomly selected sample of 175 academic staff and 216 post graduate students from the faculties of arts, social sciences and science of the University of Ghana. The study answers to the following questions:

1. Are staff and students aware of the internet and its resources?
2. How often do they use these services?
3. For what purposes do they use the internet resources?
4. What is perceived usefulness of the internet to staff and students?
5. What are the reasons for non-use of the internet?

The questionnaire was the instrument for data collection and a total of 123 and 121 questionnaires were returned by staff and students respectively. All the respondents from both staff students indicated that they are aware of the internet. E-mail was the most well known resource among the respondents followed by the WWW, discussion groups, usenet news and file transfer protocol in descending order. Telnet, Gopher and Wide Area Information Server were not well known among both groups. It was also clear that in all cases, the staff were more aware of the resources of the internet than the students. This was due to academic staff often travel abroad for conferences, courses, international seminars. 69.9% of staff and 55.4% of students indicated that they were using internet. E-mail was the most used internet resource among both staff and students followed by the WWW used by 47.2% of staff and 43.8% of students. Other resources were used by less than 20% of respondents in both groups.

**Igun (2005)** conducted a study among users in a cyber café run by the Delta State University, Arbaka. The study focused to find out the self reported level of internet skills, sources of such skills, and the additional skills desired, preferred ways of acquiring the skills and how the internet has influenced and affected their research. 100 questionnaires were distributed to first 100 persons using the university cyber café on a week day. The response rate was 81%. Among the respondents male and female constitutes 56% and 44% respectively. Among the 81 respondents 72 were students and the rest was staff and other category. Most of the respondents indicated they started using the internet several years ago. 78% of respondents acquired their internet use skills from online or through colleagues or friends. A university course

for internet was a help for only 4.9%. 53% of respondents were rated their internet skills average and 98% indicated that they needed to improve their skills on the internet. E-mail and WWW was the internet skills users want to improve much. Only a few numbers were interested in studying discussion groups, news groups, telnet and OPAC, search engines and home pages. This was due to their were not being familiar with these applications. Continuing education was the most preferred way for studying internet skills. Self study and learning from friends were the other two methods for studying internet skills. Regarding the influence of internet 54% indicated that after the use of internet they talk less on phones and 35% indicated that they now browse less printed materials. Concerning the influence on research 52% responded that the use of the internet has helped them to quickly update their research. The study concluded that there was urgent need for more internet connectivity in Delta State University and provide training for internet skills for both staff and students.

**Dadzie (2005)** investigated the use of electronic resources by students and faculty of Ashesi University, Ghana to find out the level of use, the type of information accessed and the effectiveness of the library's communication tools for information research. The tool used in this case study was questionnaire and this was distributed to all students, faculty and administrative staff. The population was 169 and the response rate was 83%. Among the samples 87% were students and 13% constituted faculty and staff. 85% of respondents mentioned that their first point of call for information was internet and the remaining respondents sought information from library. Regarding the tools for searching information from internet, 51% responded that they used search engines, 14% indicated that they just browsed, 13% used meta search engines and 7% indicated that they used the scholarly databases subscribed in their library. Concerning the purposes of using internet 27% indicated that the information was for educational purposes; 27% for news; 18% for entertainment and 11% for sports. The most used search engines are Google and Yahoo. Only 16% of respondents used information gateways and the most commonly used gateway was Pinakes. Emerald, Academic Search Premier and Blackwell-Synergy were the most commonly used scholarly databases by the respondents. Library brochure and Orientation program were the tools for disseminating information about electronic resources. Regarding the library's priority, 83%

indicated that the library should maintain the quality and quantity of its print collection; 79% indicated installing more computers to the library.

The study found that when users did not have access to electronic resources as a result of lack of PCs they would be content to use the library's print resources. From this information, the investigator stated that the print resources in any academic library are expected to complement the electronic ones. Problems encountered by the respondents were inadequate PCs, lack of information regarding the use of electronic resources and lack of time. Dadzie suggested introducing information competency across the curriculum with the active involvement of faculty or the introduction of a one unit course to teach information competency at all levels at the university.

**Kumar and Kaur (2005)** conducted a study among students and teachers of engineering colleges at Punjab. The objectives of the study were:

1. To study the use of the internet by the teachers and students in engineering colleges under study.
2. To study the various internet resources and services used by the respondents on the internet for various activities of teaching, learning and research.
3. To identify the different purposes for which the internet is used by teachers and students.
4. To examine the impact of internet on the various activities like teaching, learning and research.
5. To find out the problems faced by the respondents while using the internet.

Thirty respondents were selected randomly from each college taking at least five from each branch of each college under study. Among the five samples from each college two were teachers and three undergraduate students. From the above sampling method, there were 960 respondents and questionnaire method was used to collect data. Among the 960 respondents, 334 teachers and 474 students responded. Majority of the respondents had 2-4 years of experience of using internet and used internet 2-3 times a week. Regarding the amount of time spent on the internet, a good number of respondents used 2-4 hours a week. College was the most used location for accessing internet. According to respondents' internet use, it was primarily used for educational purpose and then for research, communication and entertainment purposes. Regarding

the use of internet resources 54.3% used the internet for consulting technical reports, 42.3% for e-books and other uses were e-journals, databases, conference proceedings, theses and dissertations. E-mail was the most popular service used by the respondents and this had been used by every respondent. WWW was the next popular services with the use of 99.7% of respondents. 73.6% of the respondents used the internet for Chatting and 50% for Frequently Asked Questions. The use of Discussion groups, Archie, Bulletin Board, Telnet, FTP ranges between 11.5% to 35%. The major purpose of e-mail was for communication followed by academic and pleasure purposes. The most commonly faced problem with internet was slow access speed. Comparing the benefits of internet over conventional documents, respondents reported that internet was easy to use, more informative, time saving, more useful and less expensive in comparison to conventional documents. Due to the use of internet, respondents opined that their professional competence has improved and expedited their research process. Majority of the respondents were partially satisfied with the facilities of the internet.

As a conclusion the study made these suggestions as the time of internet service should be increased, internet facility should be extended to the hostels and rooms of the teachers, provided computers with latest internet and printing facilities, appoint more efficient technical staff, subscription of e-journals and all the engineering colleges should develop their own web site. The study also suggested taking further research in different types of users' behavior and attitudes towards the internet.

**Luambano and Nawe (2004)** studied the internet use by students of the university of Dar es Salaam. The study also found out the level of student's access to the internet, the problems students faced in internet use as well as recommendations by respondents as to what should be done to address the problems. The population of this study comprised students, academic staff, and computer laboratory staff. A total of 100 respondents were selected for the study. Among the 100 respondents 90 were students, 5 members from both faculties and staff at the computer section. Questionnaire, interview, focus group discussion and personal observation were the tools used for the study. 86.3% responded that they were using the internet. Computer laboratories, university library and internet cafes were the places of access of internet.

The internet was becoming popular in 1996. 46.3% respondents had been using internet by more than two years; 22.6% had been using less than one year and 17.5% for one year. Most respondents spent between one to two hours per one internet session. Majority of the respondents acquired their internet use skills through teaching by friends and self teaching. Computer laboratories were the major access points for accessing internet. Respondents also used university library and internet cafes as access points. 68% responded that they used internet for electronic communication (E-mail). 50% reported that they were using it for browsing and 34% using it to access online journals. WWW were used to academic purposes, entertainment, sports, to access news etc. Students use the internet for academic purposes. E-mail was used for communication with friends, with other students, with lecturers and for participating in discussion groups. Among the respondents Google was the most preferred search engine followed by Yahoo. The reasons that hinder the affective use of internet by students and teachers were inadequate computers with internet facilities, slow internet connection, lack of skills, lack of motivation and frequent power cuts. The study concluded with the following suggestions such as provide adequate computer with increased speed internet facilities, formal training to whole students, teachers and staff and constant availability of power.

**Ur Rehman and Ramzy (2004)** carried out a study among the health professionals working in the three teaching faculties of Kuwait university. The major objectives of the study were to analyse the patterns of internet use, the internet skills of the health professionals, the perceived impact of this resource on their personal and professionals conduct and the difficulties encountered by them while using the internet. The total number of faculties in the three departments of medicine, dentistry and pharmacy were 180. 171 faculties were selected for the study. Questionnaires were distributed and the response rate was 76.6%. Out of 131 respondents only four indicated that they used computers, but did not use the internet and hence they were excluded from further analysis. Majority of the respondents had accessed internet from their office and home was the next access venue for internet. 49.6% of respondents had been using internet for more than 36 months. 32.3% and 11% of the respondents had been using internet for 36 months and 12 months respectively. Only a few members reported that they had been using internet for six months. From this

analysis it became clear that an overwhelming majority of the respondents had been using the internet for years and they are expected to be proficient, comfortable and experienced users of the system. Regarding the frequency of use of internet 80.3% stated that they used it daily and a few members were using once in a month and rarely.

Concerning the perception of using internet 65.4% perceived internet as extremely valuable and 29.95% perceived it to be quite valuable, while 4.7% perceived it to be moderately valuable. More than half of the respondents used internet for sending and exchanging files and documents on a daily or weekly basis. A good number of faculties used the internet for getting instructional materials. The other purposes of using internet are for personal use, reading news papers, magazines and downloading software. Self instruction was the most commonly used mode for learning internet by the respondents. For self instruction online help, documentation, library guides and brochures were used. 86.6% expressed the opinion that they have to improve the internet use capabilities. 67% expressed interest in developing skills for web searching which was followed by internet phone use. 52.8% wished to develop skills in web site design. The other interesting areas to improve were e-mail, telnet, discussion groups, FTP and chatting. Regarding the impact of the internet on faculty's personal and professional life 88.2% felt that the internet provided better access to information. 77.2% stated that through the internet they had better professional contacts with distant colleagues and organisations. By the use of internet, faculty members were able to use different channels of communication for their research and publication work. Another major impact was that as a result of internet use the frequency of using library and printed materials was reduced so much. Slow response rate and lack of time to internet access are the major problems faced by the faculty members. The other problems encountered were lack of training, obsolete hardware, network connection cost, few work stations, poor quality of resources available on the internet, failure of hyper links etc.

The investigator also found that health professionals were not competent in using some of the internet applications and they were eager to develop their abilities in telnet, ftp and other file transfer systems. For that the university should take

appropriate policy matters for encouraging and training the various internet facilities to the faculty members.

**Madell and Muncer (2004)** surveyed among the English secondary school students to determine whether or not gender differences exists in the internet use activity and to inform later studies of more specific aspects of this activity. 1300 students aged between 11 and 16 years old, in four different wards of Stockton-on-Tees were selected for the study. Among the respondents 50.5% were males and 49.1% were females. Questionnaires were distributed to the respondents for collecting data. 83% of the respondents stated that they had used internet. In gender wise distribution 85.7% males and 80.2% females had used internet. Respondents who were not using internet stated that lack of access to internet facility, lack of interest or motivation, lack of knowledge about how to use the internet, cost of computer hardware and software and lack of time. For non-usage of internet by gender wise distribution, girls were more likely to give the reason, “no one in house hold knows how to use it” than boys. In the use of E-mail, there was not a significant difference between the genders. However males were significantly more likely than females to use the internet for the WWW. The modal category for participants use the internet for E-mail and the WWW was “few times a week”. 77.6% of males had an E-mail address as opposed to 70.1% of females. This was a significant difference. 22.3% of males had a web page as opposed to 10.4% of females and this difference was also significant. With regard to gender differences, it was found that the number of hours per week that males used the internet was significantly higher than the number that females used it. Regarding the purpose of using internet 67.3% used the internet for playing/down loading music followed by general browsing by 56%. 54.8% used internet for E-mail and 28.2% for finding information related to education.

Boys were more likely than girls to use the internet for playing or downloading music, browsing to find out information about goods and services, buying or ordering goods, tickets or services, down loading software, including games and also using the net for accessing government or official services. However girls used the internet more than boys for using E-mail, finding information related to education and using chat rooms or sites. In age wise distribution, there was no significant association between gender and use of the internet for personal

banking/investment/financial activities, looking for job related and other purposes. For getting information regarding new web sites and web pages, 87.3% were getting assistance from their friends. 47% respondents were getting support from magazines/news papers. There were significant gender differences in finding out about new web sites/web pages via hyperlinks from other web pages, from internet search engines and from internet directories. Boys were more likely to use these methods than girls. There was significant association between gender and location of internet at work place, school/college/university, internet café/shop and other location. Boys were more likely to top the use internet at all these locations than girls. More boys than girls were using internet. But girls were more confused than boys while using internet. The problems faced by the students were irrelevant pop-up information, poor quality of information, too much of information, length of pages was too long etc. Males did not perceive the internet to be any more important in their lives than females.

The investigators concluded with the statement that most of English secondary school children were aware of and use the internet regularly and are comfortable with and enthusiastic. By improving the internet awareness and facility to school children, the policy of Government to achieve their aim of allowing every one who wants to access to the internet by 2005.

The use and non use of internet facilities of the academic staff of selected disciplines in the physical and biological sciences drawn from the 10 universities in the south western part of Nigeria was investigated by **Ehikhamenor (2003)**. Of the 467 samples 79% responded to the questionnaire. Among the samples the largest age group was that between 41 and 50. Next was the age group between 31 and 40. Of the 79% of respondents 50.4% had access to the internet. Most of the respondents used mainly private internet outfits, which were mostly commercial. Majority of the respondents learnt internet services through a course given in their universities, either by the computing centre or the library. They also learnt through self instruction and assistance from colleagues. 82% of respondents had used internet for over one year. 43.7% had used the internet for over two years. A greater proportion of the senior lecturers than scientists of other ranks had used the internet for over two years. The



**chi-square** test showed that the duration for which the scientists had been using the internet had some relationship to age. Concerning the frequency of using internet, 40.1% of the respondents spent between one and two hours a week, 22.5% spent between three and four hours and 26.2% spent between five and six hours on the internet per week. Only 7.2% reported spending 15 hours per week. The most commonly used internet services were E-mail, catalogues and databases, Electronic journals, WWW resources and free software. Very few respondents used the Gopher, Telnet, FTP or others. E-mail was mostly used by Botanists. The most frequent users of WAIS were the Statisticians, Chemists, Computer Scientists and Microbiologists. The greatest users of E-journals were the Botanists and Chemists. Uncover, American Chemical Society, Wiley InterScience, Elsevier and Ingenta were the most commonly used web sites and databases. Yahoo was the most popular search engine among the researchers. The others are FTP archives, WWW virtual library, Savvy and Magellan, Infoseek, Excite, WWW Worm and Web Crawler were sometimes used.

The problems faced by the researchers were no access to a computer, institutional tardiness, insufficient knowledge about internet resources, ease of use and cost of internet services. However, 84.3% of agricultural researchers believed that the internet will become indispensable in their research in the future.

**Uddin (2003)** identified six categories of information and communication needs of lecturers of Rajshahi University, Bangladesh. For that the author selected 30% of sample from the population of 799,240 teachers. The sample was stratified into four groups by academic designation such as Lecturer, Assistant Professor, Associate Professor and Professor. Random selection of 30% from each category of teaching was selected. The objectives formulated in the study were:

1. To explore what proportion of academics are actually making use of some internet resources;
2. To measure the effect of academic rank on the frequency of internet resource use;
3. To identify differences in key information and communication needs based on academic interests among different ranks;
4. To measure the level of contribution that the internet makes in meeting information and communication needs; and

5. To identify the reasons for potential reluctance or dissatisfaction in using the internet.

For data collection the questionnaire method was used. The level of using internet resources and the differences of internet use among the staff were measured by identifying five categories of activities such as e-mailing, browsing, downloading, using newsgroups and recreation. To measure the frequency of internet usage Likert scale was used. For information needs the categories identified were education/research publications, professional study, seminar/conference announcements, job vacancies and library and information services. The categories in communication were expert in own field, overseas friends/colleagues, overseas education/research organization, local friends/colleagues, academic supervisor and students. Among the respondents 90.3% were males and 9.6% were females. Most of the respondents were between 25-32 years. Only 8.7% of respondents reported that they have never used computers. A good number of respondents had access to the internet from their offices or departments. The most commonly used internet service among them was e-mail, which was used by 88%. The other used services were World Wide Web by 71%, and Downloading files or journals by 56%. Other resources such as Newsgroups, Mailing lists, Audi-video, Internet relay chat and Internet telephony were used by a minority of respondents. The academic staffs had a short span of internet accessing experience of six months to a year. Regarding the frequency of using e-mail most of the respondents indicated a high use of e-mail at least once a day. For browsing, Lecturers, Assistant Professors and Associate Professors were more users than Professors. Downloading of information was carried out by the academics only a few times a month. Regarding newsgroup discussion and recreational activities, almost all the academics were having the same pattern of low usage

Junior staff were accessing internet more for education/research institutions, and higher studies information than senior staff. But senior staffs accessed internet more for job vacancies information and information on seminars and conferences than junior staff. Regarding the use of internet for communication activities, more junior staffs had used it for communication with subject experts, overseas education/research institutions and academic supervisors than senior staff. But both the junior staff and senior staff had less use internet for communication with overseas friends, local friends and colleagues and contacting of students. The study among the university

academics showed that internet use by them was related to some more common needs and that some information and communication needs are dependent on proper access to internet facilities. University authorities should do the needful to overcome the obstacles faced by the university academics for the effective usage of the internet. Provide broadband internet facility and formal training of internet resources to university academics were the two urgent needs for the internet usage.

**Maheswarappa and Ebnazar (2003)** conducted a study of the use of internet resources and services in Gulbarga town. The objectives of the study were:

1. Demographic background of internet users such as environment, occupation, educational qualifications, age and gender;
2. Computer background of internet users such as knowledge of computers, place of access to computers, type of computers that they were using, operating system and the software that they were familiar with and the purposes of using computers;
3. Use of internet resources and services in Gulbaraga city, specifically to know: since how long they have been using and their overall ability in using internet; the places of accessing internet and how often they access; the time spend, the purpose, the frequency of use of different file formats and the places of access,; the frequency of use of different file formats and the places of access; the subjects on which they search websites and the web pages/home pages created by them; the search engines most often used and the steps taken after accessing and retrieving information; the opinion about internet facility and the extent of its usefulness as a tool for communication and as a source of information; and the difficulties in accessing and using the internet.

Questionnaire method was used for data collection and the sample selected from private, public sectors, university and colleges and that constitutes 123 internet users. The results of the study were summarised as follows:

1. Most of the respondents used computers at work place using Pentium systems and familiar with Windows 98 and MS Office.
2. Majority of the respondents using internet since last six months and half of them have an average ability.

3. 93% of the respondents were using internet for sending e-mails followed by visit to web sites.
4. Most frequently used internet resources were E-mail and WWW.
5. The most commonly used file format was document file formats.
6. The subject areas of web sites visited were diverse in nature.
7. Most commonly used web sites were www. Yahoo.com, www.rediff.com, www.usa.com and www.hotmail.com.
8. Most frequently used search engines were Yahoo, Rediff, MSN and Lycos.
9. Majority of the respondents prefers to read instantly on the monitor and search the internet on their own.
10. 70% of the respondents had not received any instructions in the use of internet and felt the need for training.
11. 69.9% of the respondents were not satisfied with the facilities available for surfing internet in Gulbarga city and
12. Slow accessibility, getting connectivity and lack of training were the major difficulties faced in the use of internet.

**Adika (2003)** conducted a study among faculty members of the three older universities in Ghana namely, the University of Ghana, The Kwame Nkrumah University of science \* technology and the University of Cape Coast. The objectives formulated in the study are:

1. The level of awareness among faculty of the internet and its services; as well as their motivation to use its services.
2. The access faculty have to the internet.
3. The level of internet use among faculty and the internet services used.
4. Strategies adopted in locating information on the internet.
5. Impact of the internet on the use of upto date information by faculty.

For conducting the study a sample of 130 respondents were selected from a population of 1300 faculty members from the three universities. The questionnaire was used as the tool for collecting data and the response rate was 81.5%. Among the respondents, only 40.6% have internet connection at their departments. 24.5% of

respondents responded that they have never used the internet. The investigator commented that this low rate of usage of internet was against the natural assumption of faculty would be at the forefront of the use of the internet, because information forms an integral part of research, teaching and learning. The mass media acts as the major sources of providing information regarding internet. The non users remarked that colleagues and professional association encouraged them to use the internet. For majority of the respondents, work place is the major important access point. E-mail has been the most frequently used internet service. Next major used internet service is web browsing. The respondents did not use the other internet services such as Discussion groups, FTP and Telnet. Internet was mostly used for communication. The mode values in this study shows that most of the respondents used the internet some times to find information for lecture notes, for research projects and up to date their knowledge in their area of specialization. A vast majority of users performed their search through WWW. For searching in the internet they have been using Search Engines. Only a few members used information gateways for accessing information. Faculty members used the information from internet to upgrade their knowledge in their area of specialisation. The problems faced by the respondents in using internet were lack of access of internet, cost of computer accessories and lack of internet skills. The study expressed the opinion that inspite of the internet benefits, internet use in Ghana was still very low among university faculties. For improving the use of internet the author suggested to provide formal training in internet and also develop a mechanism for constantly upgrading skills of faculty members for the continued access to the internet. Then only the faculty would gain the benefits of obtaining relevant and up-to-date information from the internet to perform their duties.

**Kumabr and Shirur (2003)** conducted a to find out the exploitation of internet resources by Sree Jayachamarajendra College of engineering (SJCE) with use of questionnaire method. The objectives of the study were the purposes for which the academic community in SJCE was using the internet; the relation between prior computer experience and the use of internet in SJCE; how far internet services had been utilized; from which channels users were getting latest information about web sites/search engines; most used internet services; the satisfaction level of users regarding working hours. Infrastruture facilities etc. Among the 100 respondents 79 members were responded. The findings of the study was as follows:

1. Most of the respondents had started using internet for more than one year.
2. 30% of academic community used the internet 2-3 times in a week.
3. Most of the users learned internet through the assistance of colleagues and friends.
4. 97% internet users indicated that they were using internet for e-mail service, while 55.7% used to obtain copies of articles;
5. 44.3% of users acquainted with the search engines through colleagues and friends followed by 17.7% through professional books and journals.
6. 53% users have got sufficient results at the time of searching the information on internet.
7. 39% of the respondents indicated that they were facing problems in using internet.

**Dulle et al, (2002)** conducted a study among agricultural researchers in Tanzania for identification of application of information technology in their research programmes. Data collection involved questionnaires to researchers selected randomly at 13 research centers selected from seven agricultural zones in Tanzania. 321 questionnaires were distributed and the response rate was 76.3%. Out of 244 samples, 170 respondents reported having access to either e-mail or the internet. Among the 170 respondents 126 had both internet and e-mail access while 44 respondents had access to e-mail only. Many respondents used their faculty/institute and departmental computer laboratories. A small number accessed internet through their office computers. On the use of the internet for information search, out of 126 respondents who reported to have access to it, 79.3% used it frequently for information search while the rest never or rarely used it for that purpose. Regarding the usefulness of internet, 29.8% rated it as excellent, 41% very good, 15.9% good and 7.9% as poor. Regarding the use of e-mail, 46.1% of the respondents reported using it often or sometimes for information request to their faculty/institute/departmental libraries. 53.9% of the respondents reported rarely or never using e-mail for information requesting purposes from such sources. In short, e-mail was not commonly used by most of the respondents for information request purposes. But in the case of using CD-ROM databases, 64.3% of respondents had used and the remaining 35.7% had never used such a technology. Regarding the

problems encountered for using internet, the respondents reported that it was increasingly becoming difficult to retrieve the right information from the internet as more and more untrained people want to access information. The other problem faced was several online catalogues includes only indexes and abstracts. As more useful information becomes available users were required to pay.

Agricultural researchers finally opined that internet as a research tool could be more beneficial if institutions subscribed to important information and internet users were trained on how to use it effectively.

**Applebee et al, (2000)** conducted a first ever-nationwide qualitative survey of academic staff use of the Internet among the academics from Australian universities.

The aims of the study were:

- 1.To identify the frequency and type of use of the internet by academics within specified disciplines in Australian universities.
- 2.To record perceptions of these users towards the internet, together with other demographic data, in order to identify barriers to the effective, or more effective, use of the internet.
- 3.To determine whether as a means of overcoming the problem of distance, more use was made of the internet by academics in universities isolated geographically, than by academics who are in large metropolitan areas.

A stratified random sampling of 1054 academics were selected for the study from all Australian universities. A total of 30 participants were chosen from each university. Mailed questionnaire was used for the survey. The academics were divided into 3 disciplines such as arts or humanities; business, management or commerce and the sciences. The response rate of the survey was 51.3%. 95.6% of the respondents had access to the internet through their personal computers in their offices. 31.5% reported that they had dial-up connection. Many of the respondents did not know about their type of internet connection. Only 9.6% of academics had getting excellent supporting services to internet. The academic staff considered themselves as have the internet skills to use the internet efficiently. Academics most commonly used E-mail

for communicating between campuses for meetings. But a vast majority of respondents indicated that they never used E-mail to communicate with students. Those who used it were electronic discussion groups or news groups for research, teaching, publication and community service or for contribution to a profession or industry. The web was marked as being most useful for research, personal use, teaching and least useful for administration, community service or for entertainment. 96.2% of the respondents stated that access to library catalogues benefited their research activities. Those who were using document and delivery services found that it was useful for research, teaching and publication.

The study found that academic discipline and frequency and type of internet use were indeed associated and similarly there was association between the frequency and type of internet use and the level, terms or mode of employment of academics. The proportion of academics who found the web useful for teaching increases as the perception of skill moves from beginner to expert. Academics with better computing skills use the internet more frequently. The barriers encountered by the academics were infrastructure deficiencies, work load and lack of time.

The results of the survey confirmed that academic use of the internet is a given fact and that university administrators must take the continued provision of this into consideration in future financial planning discussions. E-mail and the web in particular have become essential for academics at all level to enhance their research, publication, professional contributions and communicate with colleagues and students, locally and internationally, which also keeping in touch with administrative process.

**Pangannaya (2000)** conducted a study of 100 internet users at Mysore University Library. The specific objectives of the study include:

1. To understand the purposes for which the internet is being used by the students, faculty and researchers.
2. To know if there is a relationship between prior computer experience and the use of internet.
3. To identify the different search engines used by the academic community.



4. To identify the extent of awareness of the important sites in their subject fields.
5. to understand the difficulties faced in using the internet.
6. To make suggestions for improving the services of the Mysore University library Internet centre.

100 structured questionnaires were distributed, Among 50 questionnaires were distributed to the students, 25 each were distributed among the faculty members and research scholars respectively. In each group, random sampling method was used to select the sample population. The response rate of the academic community is 56%. Respondents from Science disciplines were using internet more than other disciplines. 78% of the internet users had started using the internet facility. After the introduction of service by university library, most of the users were making use of the facility atleast once in a week. Most of the respondents indicated that self training and assistance from the colleagues were the methods of learning internet skills. The various purposes for which academic community was making use of the NET were E-mail, keeping up to date, factual information, and answering specific questions, prepare assignments/seminars, entertainment, job searching etc. E-journals, Discussion lists, Bibliographic databases, document delivery service, and table of contents were the services used by the academic community with internet. The most commonly used search engine is Yahoo followed by Altavista, Infoseek and Hotbot. The difficulties faced by the users were present time slot is insufficient, unaware of the important sites in their subject, long time to get connected to a particular site, unaware of formulation of queries and retrieval of irrelevant materials.

The study concluded with the suggestions such as provide more number of high bandwidth computer terminals with printing facility, provision of extensive training programme, extension of time slot and the provision of web page links of important sites etc.

The pattern of internet use among 608 upper secondary science students from 14 schools in Kuala Lumpur, Malaysia has been done by **Wee (1999)**. The main objectives were the effects of the internet on the students learning process, the usefulness of the net and problems associated with its use. 51.5% of the students indicated that they use the internet. Self teaching was the most commonly used

method for acquiring internet skills among the school children. Students also learned internet from their friends, teachers, fathers, siblings and from attending learning programmes. The study also showed that the locality where internet terminals were placed is related to its usage. School centre was the best place for students to access internet. 70.6% of the respondent spent five hours or less per week accessing the internet. Only a few students used ten hours per week on internet. WWW was the most commonly used internet function. E-mail and Newsgroups were also used by the respondents. The majority of the respondents accessed the web more than once a week and the most popular used net browser was Internet Explorer followed by Netscape. The most commonly used search engine was Yahoo followed by Alta Vista, Info seek and Web Crawler respectively. Those who were using web mainly used it for study related purposes.

Regarding the use of E-mail, only a relatively small percentage of the respondents accessed E-mail every day. The more common frequency of e-mail use was more than once a week. The common uses through E-mail were correspondence with parents, brothers and sisters and friends. The study purposes used through E-mail were exchange of information with foreign friends, discussing mathematics, history and other home work, asking for information on subject assignments. The use of internet was significantly related to the locality of internet access. But the use of internet and the level of education were not related to the level of education. The findings of demographic variables and internet use were as follows:

- Children of parents who received higher education were more likely to be internet users.
- The students from families with higher income were more likely to use the internet.
- There was a significant relationship between gender and use of the internet.

Regarding the impact of internet, a great majority of the respondents had the opinion that internet did not affect one's learning process. Those who had positive effect mentioned that internet had increased their scope of knowledge and broadened their minds and also increased their English proficiency. Common reasons quoted by non users are lack of internet skills, non availability of internet facilities at home and

in school. The advantages mentioned by the respondents were internet provides fast and efficient access to information, lots of information, easiness of getting information, wide variety of information and up-to-date of information. The study also brings out the disadvantages of internet such as time consuming, reliability of information, difficulty to find desired information, incompleteness of the information and the presence of pornographic materials etc.

Wee opined that information skills as well as internet skills should be taught to all students and integrated in the school's curriculum. By doing this, the students can fully reap the full benefits of this information superstore to complement traditional sources in fulfilling their information needs.

**Singh (1998)** conducted a study to determine how librarians in Malaysia use the internet for work related purposes. The study was also intended to find out the type of services for which the internet was used, the frequency and purpose of use, the problems faced and the opinion on the need for the internet and its contribution to efficiency in the library. The methodology adopted was mailed questionnaire to the sample of the study which included combining the membership list of the Library association of Malaysia and all registered attendees at the 10<sup>th</sup> CONSAL meeting in 1996 who had a Malaysian Library address. A random sample of 50% of the population was selected for the survey. The response rate of the survey was 53.9%.

All the respondents had heard about the internet and 90.4% of them used it either at their place of work or at home or both. The initial modes of learning to use the internet were through a course or training session, self taught and or from a friend. According to the type of library, it was noted that academic library users spent more time on each access to the net as well as more time per week compared to other libraries. 97.3% of respondents indicated that they used e-mail and the main use of e-mail were for correspondence, primarily with overseas colleagues, for answering queries, sending out notices and minutes of meetings, communication with publishers and inter library loan or document delivery matters. All the respondents mentioned that they used WWW for information retrieval, answering reference queries, checking cataloguing data from other library catalogs and keeping posted with the information

on the latest publications. The major search engines used were Yahoo, Infoseek, Web Crawler, Excite, Magellan and Alta-Vista. The browsers used for browsing were Netscape and Internet Explorer. The number of sites visited per month by the respondents varied from 2 to 200. A comparison of the time spent on E-mail and the WWW showed that academic librarians spent more time on E-mail as compared to the respondents from other libraries. 28.2% of librarians responded that they had used Newsgroups frequently. Regarding the use of Telnet and FTP 62% had used telnet and 31.5% have used FTP. Telnet users used it for accessing OPACs and Library Catalogues of other institutions and Bibliographic databases. Those who were using FTP used it for downloading articles, news, antivirus software and software for the enhancement of the net. 82.7% of Librarians expressed the opinion that internet was an essential tool while 14.74% had the opinion of internet was useful occasionally.

Regarding the contribution of internet to improving efficiency, 65.3% reported that it had increased the efficiency a great deal and 32% marked a fair amount of improvement in efficiency. The major problem faced by librarians was the lack of time and only 18.7% indicated the lack of skills of internet. 67.6% respondents had the opinion about the type of materials should not be available in net were pornographic materials, racially sensitive materials and confidential items.

Singh concluded with a statement that as intermediaries between complex information resources and a diverse clientele, the findings on information seeking and retrieval can lead to a better understanding of worker productivity in general.

Obst (1998) conducted a study on the use of internet resources by German medical professionals. The objectives of the study were intensity of internet usage, preferred services and resources and advantages of using the internet. 300 questionnaires were distributed and ninety complete questionnaires were returned. The study found that all the respondents were aware of various internet resources. All the respondents in the study used E-mail and 85.6% used news groups followed by WWW, FTP, Gopher, Archie, Telnet Veronica and the Internet Relay Chat. 83.7% of the respondents used the internet from one hour a week to two hours a day. The study concluded with the suggestions such as presentation of internet resources, internet

introduction courses, evaluation of the internet resources, databases, OPAC and ILL via internet.

**Lazinger et al, (1997)** conducted a study among the faculty members in various disciplines in the Hebrew University of Jerusalem to find out the internet use, differences in usage of internet among various disciplines and perceived importance of the internet between two major groups of faculty members those in the sciences and agriculture and those in humanities, social sciences or law. The tool used in the study was questionnaire. Most of the faculty acquired Internet skills from training courses. From the study it became clear that faculty members in science and agriculture group were used more than social science and humanities group. E-mail was considered as the most commonly used Internet service and it was used for correspondence with colleagues about research issues. The other Internet services used by the faculty members were FTP, List serves/newsgroups and Search interfaces. Regarding the influence of internet, faculty members had the opinion of increase in cooperation with colleagues with improved access to databases and research updates.

### **Conclusion**

It is observed that in these studies different methodologies have been used and different aspects of internet use has been dealt with. After reviewing all the articles, a clear idea is arrived to carryout the present study.

## References

- Adika, Gifty (2003). Internet use among faculty members of universities in Ghana. *Journal of Library Review*, 52(1), 29-37.
- Adogbeji, Oghenevwogaga Benson, & Toyo, Oghenevwogaga David (2006). The impact of the internet on research : the experience of Delta State University, Nigeria. 8(2), accessed <http://libr.unl.edu.2000/LPP/ppv8n2.htm>
- Al-Ansari, Husain (2006). Internet use by the faculty members of Kuwait University. *The Electronic Library*. 24(6), 791-803.
- Ansari, Mehtab Alam, & Jilani, Gulam (2008) . Internet use by students of the Delhi University. *Information Studies*, 14(3), 163-171.
- Anunobi, Chinwe V. (2006). Dynamics of internet usage : A case of students of the federal University of Technology, Owerri (FUTO), Nigeria. *Educational Research and Reviews*, 1 (6), 192-195. Retrieved September 1, 2008 from <http://www.academicjournals.org/ERR/pdf2006/Sep/Anunobi.pdf>
- Aplebee, Ann, Clayton, Peter, Pascoe, Celina and Bruce, Hary (2000). Australian academic use of the internet : Implications for university administrators. *Internet research : electronic networking applications and policy*. 10(2), 141-149.
- du, Edwin Ellis, & Markwei, Evelyn D. (2005). Internet awareness and use in the university of Ghana. *Information Development*. 21(4) ,260-268.
- adar, B.S. & Kumar, Sampath B.T. (2008). Use of search engines by research scholars and faculty members of physics departments in the universities of Karnataka state. *Annals of Library and Information Studies*, 55, 62-68.

Biradar, B.S., Rajashekar, C.R., & Kumar, Sampath B.T., (2008). Students and Faculties' searching behaviour and the internet: use of search engines for retrieval of scholarly information. *Library Herald*, 46(1), 21-30.

Chiemeke, S., Longe, O.B., Umar, S.S., & Shaib, I.O., (2007 ). Users' perceptions of the use of academic libraries and online faculties for research purposes in Nigeria. *Library Philosophy and Practice*. Retrieved October 7, 2008 from <http://www.webpages.uidaho.edu/mbolin/chiemeke-longe.pdf>

Dadzie, Perpetua S. (2005). Electronic resources : Access and usage at Ashesi University College. *Campus Wide Information Systems*. 22(5), 290-297.

Dulle, F.W., Mulimila, R.T., Matovelo, D.S and Lwehabura, M.J.F (2002) . Application of information technology for research in Tanzania: feedback from agricultural researchers. *Journal of Information Science*, 28 (2), 157-162.

Ehikhamenor, Fabian A. (2003) Internet facilities : Use and non-use by Nigerain university scientists. *Journal of Information science.*, 29(1), 35-48.

Hinson, Robert, and Amidu, Mohammed (2006). Internet adoption amongst final year students in Ghana's oldest business school. *Journal of Library Review*. 55(5), 27-36.

Igun, Stella E (2005). Users and Internet skills : a report from Delta State University, Abraka, Nigeria. 6(3). Retrieved on September 27, 2007 from <http://southernlibrarianship.icaap.org/content/vbn03/igun.s01.htm>

Khare, Shashi Kant, Thapa, Neelam & Sahoo, K.C. (2007). Internet as a source of information : A survey of Ph.D scholars. *Annals of Library and Information Studies* vol.54 December 2007, 201-206.

Kumar, Rajeev, & Kaur, Amritpal (2006). Internet use by teachers and students in Engineering colleges of Punjab, Haryana, and Himachal Pradesh states of India: an analysis. 7(1), Retrieved September 27, 2008 from <http://southernlibrarianship.icaap.org/conetn/v07no1/kumar-raj.htm>

- Kumar, Rajeev, & Kaur, Amritpal (2005). Internet and its use on the engineering colleges of Punjab, India : A case study. *Webology*. 2(4), December 1-20. Retrieved on September 1, 2008 from <http://www.webology.ir/2005/v2n4/a21.htm>
- Kumbar, Mallinath, & Shirur, Shiddayya (2003). Internet and its use in Sree Jayachamarajendra College of Engineering : A case study. *SRELS Journals of Information Management*, 40(2), 169-176.
- Lal, P., Malhotra, Ahuja S, and Ingle G.K (Oct-Dec. 2006). Internet use among the medical students and residents of a medical college of north India. *Indian Journal of community medicine*. 31(4), 293-294.
- Lazinger, Susan S., Bar-Illan, Judit & Peritz, Bluma C. (1997). Internet use by faculty members in various disciplines : A comparative case study. *Journal of the American Society for information science*, 48(6), 508-518.
- Luambano, Ireneus, & Nawe, Julita (2004). Internet use by the students of the university of Dar es SaLibrary . *Hi Tech News*. 10., 13-17.
- Madell, Dominic & Muncer, Steven (2004). Gender differences in the use of the internet by English secondary school children. *Social Psychology of Education*, 7, 229-251.
- Madhusudhan, Margam (2007). Internet use by research scholars in university of Delhi, India. *Library Hi Tech News*, 8, 36-42.
- Mahajan, Preeti (2006). Internet used by researchers: A study of Punjab University, Chandigarh. *Library Philosophy and practice*, 8( 2 ). Retrieved September 27, 2007 from <http://www.webpages.uidaha.edu/mbolin/mahaian2.pdf>
- Meswarappa, B.S., & Ebnazar, C. Emmanuel (2003). Use of internet resources and services in Gulbarga city : An exploratory study. *SRELS Journal of Information Management*, 40(4), 404-420.



- Obst, Oliver (1998). Use of internet resources by German medical professionals. *Bulletin of Medical Library Association*, 86(4), 528-533.
- Pangannaya, N.B. (2000). Use of internet by the academic community : A case study. IN: *Proceedings of DRTC Annual Seminar on Electronic Sources of information*. 1-3 March 2000.
- Riahinia, Nosrat ,& Azimi, Ali (2007). Women and the web : an evaluation of academic Iranian women's use of the internet in Tarbiat Moalem university (TMU). *The Electronic Library*, 26(1), 75-82.
- Saravanan, P., & Mary, Lawrence A. (2007). Teachers approach to Internet and online information resources. *IASLIC Bulletin*, 52(3), 150-157.
- Shihab I.(2007). Internet searching habits of library professionals in Kerala. *Kelpro Bulletin*. 11(2), 35-41.
- Singh, Diljit (1998). The use of internet among Malaysian Librarians. *Malaysian Journals of Library and Information Science*. 3(2).11-16.
- Trivedi, Mayanki, & Joshi, Anuradha (2008). Computer and Internet use by health care professionals in a rural medical college in India. *Library Philosophy and Practice*, Retrieved October 29, 2008 from <http://libr.unl/edu.2000/LPP/trivedi-joshi.html>
- Uddin, Mohammad Nasir (2003). Internet use by university academics: a bipartite study of information and communication needs. *Online Information Review*. 27(4), 225-237.
- Ur Rehman, Sajjad & Ramzy, Vivian (2004). Internet use by health professionals at the health sciences centre of Kuwait University. *Online Information Review*.28(1), 53-60.
- Yee, S.H (1999). Internet use amongst secondary school students in Kuala Lumpur, *Malaysian Journal of Library & Information science*, 4(2), 1-20.

## Chapter IV

### Research Methodology

This chapter describes the research design, sample, measures used, procedure adopted for the collection of data, and the statistical methods employed for the analysis of data.

#### 4.1 Population

The populations of each university under each of the derived four disciplines are enumerated as follows.

#### Population

**Table 4.1 Population of the study**

Sl. No.	University	Pure Science	Applied Science	Social Sciences	Languages	Total
1	<b>Kerala</b>	42	16	40	22	120
2	<b>M.G</b>	21	15	29	8	73
3	<b>CUSAT</b>	23	66	19	8	116
4	<b>SSUS</b>			32	42	74
5	<b>KAU</b>		129			129
6	<b>Calicut</b>	49	10	33	29	121
7	<b>Kannur</b>	9	6	9	5	29
	<b>Total</b>	<b>144</b>	<b>242</b>	<b>162</b>	<b>114</b>	<b>662</b>

#### 4.2 Sample of the respondents

The empirical study which attempted to analyse the “Internet utilization and academic activities of faculty members in the universities of Kerala” collected relevant information related to the subject from the faculty members of all departments at the post-graduates.

Permanent faculty members of the seven universities in Kerala viz., University of Kerala, Thiruvananthapuram, Mahatma Gandhi University, Kottayam, Cochin University of Science & Technology, Ernakulam, Sree Sankaracharya University of Sanskrit, Ernakulam, Kerala Agricultural University, Thrissur, University of Calicut, Calicut and Kannur University, Kannur. Faculty formed the universe of the study.

The faculty members are categorized into four disciplines such as Pure Sciences, Applied Sciences, Social Sciences and Languages. The disciplines are identified with the help of Dewey Decimal Classification scheme. Thus Pure Science includes departments like Mathematics, Statistics, Physics, Chemistry, etc. Applied Science includes Electronics, Engineering, Agriculture, etc., Social Science includes Sociology, Economics, Law and Language includes English, Malayalam, Sanskrit, Hindi etc.,

As a preliminary step an enlistment survey of faculty members are collected from the personal visit to each university, university diaries of seven universities of the year 2007, and websites of universities.

From the enlistment survey 50% of faculty members who are appointed permanently were selected for the study using sample, Stratified Random Sampling method. Thus a total of 331 faculty members with a distribution of 72 from Pure Sciences, 121 from Applied Sciences, 81 from Social Sciences and 57 from Languages came under the purview of the study. The sample derived is enumerated below:

**Table 4.2 Sample of the study**

<b>Discipline</b>	<b>Population</b>	<b>Sample (N=331)</b>
<b>Pure Science</b>	144	72
<b>Applied Science</b>	242	121
<b>Social Science</b>	162	81
<b>Language</b>	114	57

A total of 331 faculty members of various designations ranging from that of Directors/Head of the Departments, Professors, Readers, Senior Lecturers, Lecturers are selected from all the disciplines.

#### **4.3 Tools used in the study**

To get an idea about the similar studies conducted in the area of internet use and allied subjects, an exhaustive literature search was carried out to find out the related publications. For this many primary periodicals, secondary periodicals like LISA Plus (Library and Information Science Abstracts) in CD-ROM, books, conference proceedings, reports and internet sources were also consulted. Details about the past studies made in the area of internet use were reviewed in Chapter II of this thesis.

The required data pertaining to the study was collected using Questionnaires.

A pre test study was carried among 15 faculty members from each of the four disciplines were carried out and after that the questionnaire was finalised. Data is collected during the period of November 2007 to March 2008. The investigator visited the faculty members at their universities and distributed the questionnaires individually. The questionnaires bounded with covering letter and the stamped envelope with investigators' address. The investigator also

collected the personal telephone numbers of the faculty members. On receipt of the questionnaires some of the faculty members promptly returned the same duly completed then and there. 40% of the filled questionnaires were received within the two weeks. For getting the remaining questionnaires investigator personally contacted the faculty members over telephone and reminded them. After the first reminder 50% of the filled in questionnaires were returned to the investigator. Remaining 10% of the questionnaires were received after the second reminder.

**The questionnaire divides into seven sections as follows:**

**Section A** gives a general profile in terms of name, age, sex, designation, department, university and years of experience of the faculty members who came under the purview of the study.

**Section B** enquires about the awareness, opinion or knowledge about internet by the faculty members. For that the questions related to the awareness, period of hearing internet, sources of information, importance given by the faculty members, opinion regarding influence etc are mentioned in this part.

**Section C** tries to find out the attitude of faculty members regarding internet. For measuring the attitude, the scale developed by Yixin Zhang was used.

**Section D** attempts to find out the practice level of faculty members. For that the frequency of using internet, place where internet is accessing, for what activities internet is using, how the internet information is using, methods to access internet etc is incorporated in this section.

**Section E** measures the influence/impact of internet in the professional life of faculty members.

**Section F** enquires about the availability of internet services in the university libraries in Kerala where the faculty members are teaching and the internet services provided by the university libraries.

**Last section, Section G** covers the satisfaction of internet search results, problems encountered by the faculty members while searching internet, the comparison of internet over conventional documents and the suggestions given by the faculty members.

The Internet Attitude scale of Zhang (2007) is described as follows:

Zhang developed an internet attitude scale which consists of 40 items, with 10 items describing each of the four internet attributes- enjoyment, usefulness, anxiety and self efficacy. The 40 items using a 4 point Likert-type scale, where strongly disagree=1, disagree=2, agree=3 and strongly agree=4. Among them, 10 items were constructed for each individual subscale. The maximum score for each subscale was 40. A higher score on a scale indicated more enjoyment, feeling more usefulness, self efficacy and less anxiety.

The first experiment initiated generic internet attitude questionnaire, ensured construct validity and examined factorial validity and reliability. The first experiment was carried out among the 302 undergraduate and graduate students from a mod south state supported university in the U.S. The second experiment further analysed the results of the first experiment to verify criterion validity and reliability using a different sample group. The second experiment sample was carried out among the 680 voluntary participants. The results of both the first and second experiment illustrated that this newly developed Internet Attitude Scale (IAS) was a valid and reliable instrument for measuring internet attitudes.

#### **4.4 Techniques used for analysis**

The collected data were analyzed using SPSS 11<sup>th</sup> version. The various statistical techniques employed are:

#### **4.4.1. Percentage Analysis**

Simple percentage analysis was undertaken to study the use of various internet services users in different categories as well as for relevant sub-samples formed on the basis of sex, age, designation, etc.

#### **4.4.2. Mean and Standard Deviation**

The mean is a measure of where the center of a distribution lies. It is simply the sum of all observations divided by the number of observations.

Standard deviation is a measure of how far the observations in a sample deviate from the mean. It is analogous to an average distance from the mean. It also serves as an estimate of the dispersion in the broader population from which a sample is taken. If the data are normally distributed, then the standard deviation and mean can be used to determine what proportion of the observations fall within any given range of values.

#### **4.4.3. “t” Test**

Whenever an experiment involves two group means, a statistical analysis called ‘t test’ may be carried out to determine if there is any difference between them. A t-test of the difference of two means, if significant, simply states that the classification criterion is relevant and that it makes a difference in the two groups. The ‘t’ test gives two statistics that can be used to conduct a test of the mean a “t” value (T) and a p value (P). The t-value is not very informative by itself but it used to calculated the P value. In this study ‘t’ test is used for gender wise distribution of certain variables in the utilization and attitude are analysed.

#### **4.4.4. Correlation analysis**

Correlation is a measure of relationship between two variables. The correlation coefficient gives a mathematical value for measuring the strength of the linear relationship between two variables. It can take values from  $-1$  to  $+1$ . The larger the value of the coefficient, the stronger the linear relationship between the variables. An absolute value of one indicates a perfect linear

relationship, and a value of zero indicates the absence of a linear relationship. The sign of the correlation indicates the direction of the relationship. If both the variables tend to increase or decrease together, the coefficient is positive. If one variable tends to increase as the other decreases, the coefficient is negative.

For this research work, correlation between the variables gender, discipline, age and years of service of the respondents and the influence of internet interaction are studied.

#### **4.4.5. ANOVA (Analysis of Variance)**

Analysis of variance is employed to test for the differences among the means of the population by examining the amount of variations within each of the sample, relative to the amount of variations between samples. The basic idea here is that we want to compare groups on some dependent variables of interest (Punch, 2006). There may be variations between samples and also within the sample items. The technique of ANOVA consists of splitting the variance for analytical purposes into its various components. Normally the variance is split into variance between groups and variance within groups. According to Gaur and Gaur (2006) the conditions for the use of ANOVA are:

1. The dependent variable should be interval or ratio data type.
2. The populations should be normally distributed and the population variances should be equal.

In the ANOVA, two estimations of population variation is derived. One based on between group variance and the other based on within group variance. A ratio of these two estimates of population variance is calculated. This is noted as the F. The value of 'F' may be compared to the F-limits for given degrees of freedom (df). If the F value exceeds the F-limit values, it is stated that there are significant differences among the sample means.

When one has reasons to believe that some relevant variables, which has not been adequately controlled in the study co-vary with the study variables



and make an effect in the group differences estimated, one may proceed to adjust for those effects statistically. One method frequently used for this purpose is the analysis of co-variance. As in the case of ordinary ANOVA, analysis of co-variance splits the total variance into its various components, viz., main effects (resulting from classificatory factors); interaction effects (between classificatory factors); and effects due to the co-variates. Thus, one is enabled to find out if the group differences, devoid of the effect of the co-variates are significant.

Through ANOVA technique, one can, in general, investigate any number of factors, which are hypothesized or said to influence the dependent variable. One may as well investigate the differences amongst various categories within each of these factors, which may have a large number of possible values. If there is only one dimension for classification and there are several possible values for the classificatory dimension, one way ANOVA technique is used. In a two or more way ANOVA, the interaction, if any, between two or more independent variables affecting the dependent variable can as well be estimated for better decisions.

In this research work, certain variables such as utilization, knowledge, attitude, quality, frequency, awareness etc. related to various disciplines are analysed with ANOVA.

#### **4.4.6. Chi-square test**

Chi-square ( $\chi^2$ ) is a non parametric test and it can be used to determine if categorical data shows dependency or the two classifications are independent. The t- test, in fact, a technique through the use of which it is possible for all researchers to (i) test the goodness of fit; (ii) test the significance of association between two attributes, and (iii) test the homogeneity or the significance of population variance (Kothari, 1996).

Chi square is a measure of actual divergence of the observed and expected frequencies. If there is no difference between actual and observed frequencies, the value of the Chi-square is zero. The greater the discrepancy between observed and expected frequencies, the greater the value of  $\chi^2$ . If the

calculated value is less than the table value, it indicates that the difference between actual and observed frequencies may have arisen due to chance of fluctuations and can be ignored. The quantity of  $\chi^2$  is defined as

$$\chi^2 = \sum (O-E)^2/E$$

Where O refers to the observed frequencies and E refers to the expected frequencies. Steps to determine the value of  $\chi^2$  are :

1. Calculate the expected frequencies.
2. Take the difference between observed and expected frequencies and obtain the square of these differences i.e, obtain the value of  $(O-E)^2$ .
3. Divide the quantity  $(O-E)^2$  obtained in step (ii) by the expected frequency and obtain the sum over cells  $\sum (O-E)^2/E$ .

This gives the value of  $\chi^2$  and is compared with the table value of  $\chi^2$  for given degree of freedom at a certain specified level of significance. If the calculated value of  $\chi^2$  is more than table value  $\chi^2$  the difference between theory and observation is considered to be significant, i.e, it could not have arisen due to fluctuations of simple sampling. If, on the other hand, the calculated value of  $\chi^2$  is less than the table value, the difference between theory and observation is not considered as significant and this may be due to fluctuations of simple sampling and hence ignored.

In this study Chi-square test is used to find out the association between variables such as gender, age, years of service and opinion of internet in improving academic efficiency, internet skills, satisfaction of internet results etc. are analysed.

The analysis is presented and interpreted by using tables, charts and figures.

This chapter has presented the design of the present study in detail including the tools and procedure for data collection and the statistical techniques used for data analysis.

## References

- Zhang, Yixin (2007). Development and validation of an internet use attitude scale .  
*Computers & Education, 49*, 243-25.
- Punch, Keith F. (2006). *Quantitative and qualitative approaches*. 2<sup>nd</sup> ed.. London:  
Sage Publications.
- Gaur, Ajai S., & Gaur, Sanjaya S. (2006). *Statistical methods for practice and  
research : a guide to data analysis using SPSS*. NewDelhi: Sage  
Publications.
- Kothari, C.R.(1996). *Research methodology : methods & techniques*. New Delhi:  
Wishwa Prakashan.

## **Chapter V**

# **ANALYSIS OF DATA**

This present chapter has attempted to find out the “Internet utilization and academic activities of faculty members in the universities of Kerala.” For an easy and comprehensive understanding, this chapter has been divided into seven sections.

### **Section A**

Section A gives a general profile in terms of name, age, sex, designation, department, university and years of experience of the faculty members who came under the purview of the study.

#### **Age of the Respondents**

Table 5.1 depicting the age-wise distribution of the faculty members in the various universities of Kerala and it shows that 35% of faculty members are within the age group of 45-55. Those within the age group of 35-45 closely followed it with 34.4%. The younger group i.e. less than 35 years of age category formed 23.6% of the population under study.

**Table 5.1 Age of the respondents**

Discipline	Age of the respondents				Total
	Less than 35	35-45	45-55	Above 55	
Pure Science	5	33	22	12	72
	6.9%	45.8%	30.6%	16.7%	100.0%
Applied Science	32	31	53	5	121
	26.4%	25.6%	43.8%	4.1%	100.0%
Social Science	21	30	25	5	81
	25.9%	37.0%	30.9%	6.2%	100.0%
Language	20	20	16	1	57
	35.1%	35.1%	28.1%	1.8%	100.0%
Total	78	114	116	23	331
	23.6%	34.4%	35.0%	6.9%	100.0%

It is evident from the above table that the discipline of Language had comparatively a higher representation in the younger age group with 35.1%. On the other the Pure Science discipline had a greater number of faculties who are above 55 yrs. On the whole, the age category of 35-55 dominated in all the disciplines.

## Genderwise distribution of the respondents

Table 5.2 indicating the gender wise distribution of faculty members portrays that males outnumbered females by a margin of 4.6% i.e., as against the 47.7% females, the males constituted 52.3%.

**Table 5.2 Gender of the respondents**

Discipline	Gender		Total
	Male	Female	
Pure Science	56	16	72
	77.8%	22.2%	100.0%
Applied Science	49	72	121
	40.5%	59.5%	100.0%
Social Science	45	36	81
	55.6%	44.4%	100.0%
Language	23	34	57
	40.4%	59.6%	100.0%
Total	173	158	331
	52.3%	47.7%	100.0%

Male representation was found to be higher in the Pure Science discipline with 77.8%, the female representation was highest in the Language discipline with 59.6% closely followed by Applied Science with 59.5%.

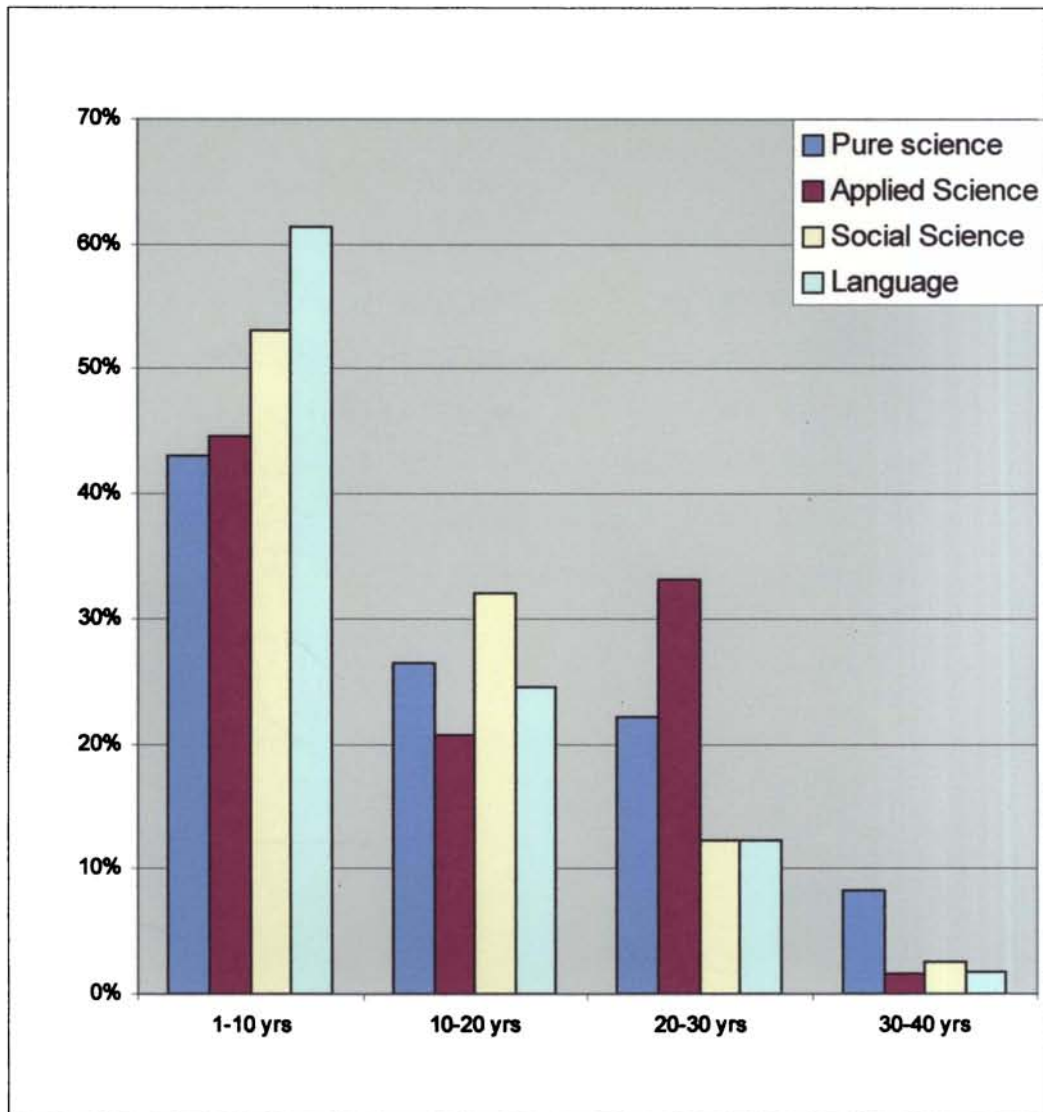
**Table 5.3 Years of service**

Discipline	Years of service				
	1-10 yrs	10-20 yrs	20-30 yrs	30-40 yrs	Total
Pure Science	31	19	16	6	72
	43.1%	26.4%	22.2%	8.3%	100
Applied Science	54	25	40	2	121
	44.6%	20.7%	33.1%	1.6	100%
Social Science	43	26	10	2	81
	53.1%	32.1%	12.3%	2.5%	100%
Language	35	14	7	1	57
	61.4%	24.6%	12.3%	1.8%	100%
Total	163	84	73	11	331
	49.2%	25.4%	22.1%	3.3%	100%

Table No. 5.3 depicts that almost an equal percent of faculty members across the disciplines had 1-10 (49.2%) and 10-20 years (47.5%) of experience in their service. 3.3% of faculty members were in the field for over 30 years.

As seen from the above table, in all the disciplines the faculty members with 1-10 years of experience dominated the others. Here too, the discipline of Language had highest representation with 61.4%. Among the 30-40 years of experience category, faculty members of Pure Science category dominated others with 8.3%.

**Figure 5.1 Years of service of the respondents**





## Section B

Section B enquires about the awareness, opinion or knowledge about internet by the faculty members.

### Year of Knowledge about Internet

Table 5.4 showing the year of knowledge about internet according to various disciplines portrays that (48% ) of the faculty members of the sample population have heard about internet between 5-10 years back. Those who have heard about it much earlier i.e. 10-15 years and 15-20 years back constituted 29.6% and 15.4% respectively of the respondents. Among the others, 5.1% have heard about it recently, i.e., less than 5 years. 1.8% however, have known about it much earlier (above 20 years)

**Table 5.4 Year of Knowledge about Internet**

Discipline	Year of Knowledge about Internet					Total
	Less than 5 years	5-10 years	10-15 years	15 -20 yrs	Above 20 years	
Pure Science	2	30	25	12	3	72
	2.8%	41.7%	34.7%	16.7%	4.2%	100.0%
Applied Science	3	57	34	25	2	121
	2.5%	47.1%	28.1%	20.7%	1.7%	100.0%
Social Science	8	35	24	13	1	81
	9.9%	43.2%	29.6%	16.0%	1.2%	100.0%
Language	4	37	15	1	0	57
	7.0%	64.9%	26.3%	1.8%	0	100.0%
Total	17	159	98	51	6	331
	5.1%	48.0%	29.6%	15.4%	1.8%	100.0%

## References

- Adika, Gifty (2003). Internet use among faculty members of universities in Ghana. *Journal of Library Review*, 52(1), 29-37.
- Adogbeji, Oghenevwogaga Benson, & Toyo, Oghenevwogaga David (2006). The impact of the internet on research : the experience of Delta State University, Nigeria. 8(2), accessed <http://libr.unl.edu.2000/LPP/ppv8n2.htm>
- Al-Ansari, Husain (2006). Internet use by the faculty members of Kuwait University. *The Electronic Library*. 24(6), 791-803.
- Ansari, Mehtab Alam, & Jilani, Gulam (2008) . Internet use by students of the Delhi University. *Information Studies*, 14(3), 163-171.
- Anunobi, Chinwe V. (2006). Dynamics of internet usage : A case of students of the federal University of Technology, Owerri (FUTO), Nigeria. *Educational Research and Reviews*, 1 (6), 192-195. Retrieved September 1, 2008 from <http://www.academicjournals.org/ERR/pdf2006/Sep/Anunobi.pdf>
- Applebee, Ann, Clayton, Peter, Pascoe, Celina and Bruce, Hary (2000). Australian academic use of the internet : Implications for university administrators. *Internet research : electronic networking applications and policy*. 10(2), 141-149.
- Badu, Edwin Ellis, & Markwei, Evelyn D. (2005). Internet awareness and use in the university of Ghana. *Information Development*. 21(4) ,260-268.
- Biradar, B.S. & Kumar, Sampath B.T. (2008). Use of search engines by research scholars and faculty members of physics departments in the universities of Karnataka state. *Annals of Library and Information Studies*, 55, 62-68.

- Biradar, B.S., Rajashekar, C.R., & Kumar, Sampath B.T., (2008). Students and Faculties' searching behaviour and the internet: use of search engines for retrieval of scholarly information. *Library Herald*, 46(1), 21-30.
- Chiemeke, S., Longe, O.B., Umar, S.S., & Shaib, I.O., (2007 ). Users' perceptions of the use of academic libraries and online faculties for research purposes in Nigeria. *Library Philosophy and Practice*. Retrieved October 7, 2008 from <http://www.webpages.uidaho.edu/mbolin/chiemeke-longe.pdf>
- Dadzie, Perpetua S. (2005). Electronic resources : Access and usage at Ashesi University College. *Campus Wide Information Systems*. 22(5), 290-297.
- Dulle, F.W., Mulimila, R.T., Matovelo, D.S and Lwehabura, M.J.F (2002) . Application of information technology for research in Tanzania: feedback from agricultural researchers. *Journal of Information Science*,28 (2), 157-162.
- Ehikhamenor, Fabian A. (2003) Internet facilities : Use and non-use by Nigerain university scientists. *Journal of Information science.*, 29(1), 35-48.
- Hinson, Robert, and Amidu, Mohammed (2006). Internet adoption amongst final year students in Ghana's oldest business school. *Journal of Library Review*. 55(5), 27-36.
- Igun, Stella E (2005). Users and Internet skills : a report from Delta State University, Abraka, Nigeria. 6(3). Retrieved on September 27, 2007 from <http://southernlibrarianship.icaap.org/content/vbn03/igun.s01.htm>
- Khare, Shashi Kant, Thapa, Neelam & Sahoo, K.C. (2007). Internet as a source of information : A survey of Ph.D scholars. *Annals of Library and Information Studies* vol.54 December 2007, 201-206.
- Kumar, Rajeev, & Kaur, Amritpal (2006). Internet use by teachers and students in Engineering colleges of Punjab, Haryana, and Himachal Pradesh states of India: an analysis. 7(1), Retrieved September 27, 2008 from <http://southernlibrarianship.icaap.org/conetn/v07no1/kumar-raj.htm>

Kumar, Rajeev, & Kaur, Amritpal (2005). Internet and its use on the engineering colleges of Punjab, India : A case study. *Webology*. 2(4), December 1-20. Retrieved on Spetember 1, 2008 from <http://www.webology.ir/2005/v2n4/a21.htm>

Kumbar, Mallinath, & Shirur, Shiddayya (2003). Internet and its use in Sree Jayachamarajendra College of Engineering : A case study. *SRELS Journals of Information Management*, 40(2), 169-176.

Lal, P., Malhotra, Ahuja S, and Ingle G.K (Oct-Dec. 2006). Internet use among the medical students and residents of a medical college of north India. *Indian Journal of community medicine*. 31(4), 293-294.

Lazinger, Susan S., Bar-Illan, Judit & Peritz, Bluma C. (1997). Internet use by faculty members in various disciplines : A comparative case study. *Journal of the American Society for information science*, 48(6), 508-518.

Luambano, Ireneus, & Nawe, Julita (2004). Internet use by the students of the university of Dar es SalLibrary . *Hi Tech News*. 10., 13-17.

Madell, Dominic & Muncer, Steven (2004). Gender differences in the use of the internet by English secondary school children. *Social Psychology of Education*, 7, 229-251.

Madhusudhan, Margam (2007). Internet use by research scholars in university of Delhi, India. *Library Hi Tech News*, 8, 36-42.

Mahajan, Preeti (2006). Internet used by researchers: A study of Punjab University, Chandigarh. *Library Philosophy and practice*, 8( 2 ). Retrieved September 27, 2007 from <http://www.webpages.uidaha.edu/mbolin/mahaian2.pdf>

Maheswarappa, B.S., & Ebnazar, C. Emmanuel (2003). Use of internet resources and services in Gulbarga city : An exploratory study. *SRELS Journal of Information Management*, 40(4), 404-420.

- Obst, Oliver (1998). Use of internet resources by German medical professionals. *Bulletin of Medical Library Association*, 86(4), 528-533.
- Pangannaya, N.B. (2000). Use of internet by the academic community : A case study. IN: *Proceedings of DRTC Annual Seminar on Electronic Sources of information*. 1-3 March 2000.
- Riahinia, Nosrat ,& Azimi, Ali (2007). Women and the web : an evaluation of academic Iranian women's use of the internet in Tarbiat Moalem university (TMU). *The Electronic Library*, 26(1), 75-82.
- Saravanan, P., & Mary, Lawrence A. (2007). Teachers approach to Internet and online information resources. *IASLIC Bulletin*, 52(3), 150-157.
- Shihab I.(2007). Internet searching habits of library professionals in Kerala. *Kelpro Bulletin*. 11(2), 35-41.
- Singh, Diljit (1998). The use of internet among Malaysian Librarians. *Malaysian Journals of Library and Information Science*. 3(2).11-16.
- Trivedi, Mayanki, & Joshi, Anuradha (2008). Computer and Internet use by health care professionals in a rural medical college in India. *Library Philosophy and Practice*, Retrieved October 29, 2008 from <http://libr.unl/edu.2000/LPP/trivedi-joshi.html>
- Uddin, Mohammad Nasir (2003). Internet use by university academics: a bipartite study of information and communication needs. *Online Information Review*. 27(4), 225-237.
- Ur Rehman, Sajjad & Ramzy, Vivian (2004). Internet use by health professionals at the health sciences centre of Kuwait University. *Online Information Review*.28(1), 53-60.
- Wee, S.H (1999). Internet use amongst secondary school students in Kulal lumpuer, *Malaysian Journal of Library & Information science*, 4(2), 1-20.

The table further portrays that in all the disciplines, most of the faculty members has had knowledge about internet from years back. More than three fourth of them across all the four disciplines have heard about it between 5-15 years. Nevertheless there are a few (5.1%) who are at their preliminary stage with respect to the knowledge about internet. Of this the Social Science group is represented with the highest of 9.9%.

Among those who have acquired knowledge about internet years back the Applied Science discipline outnumbered all the others. The lowest with respect to the acquiring of knowledge earlier, is reported from the Language discipline with 1.8% followed by the Social Science group with 17.2% ( above 15 years).

**Table 5.5 ANOVA table for the year of knowledge according to discipline**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	284.274	3	94.758	5.774	.001
<b>Within Groups</b>	5366.850	327	16.412		
<b>Total</b>	5651.124	330			

The ANOVA table on the year of knowledge according to the discipline display that both these differ significantly. The obtained p value i.e., 0.001 is much lower the significant level of 0.05.

**Source of information about Internet**

Newspaper is the medium through which most of the faculty members (48.3%) obtained the information about internet. For, 31.1% of faculty members the source of information was television. Friends and Colleagues as the source of information regarding internet was represented by 25.9%. The other sources of information are books and journals, educational institutions like schools, colleges, universities, parents, relatives, and teachers.

## Internet Literacy

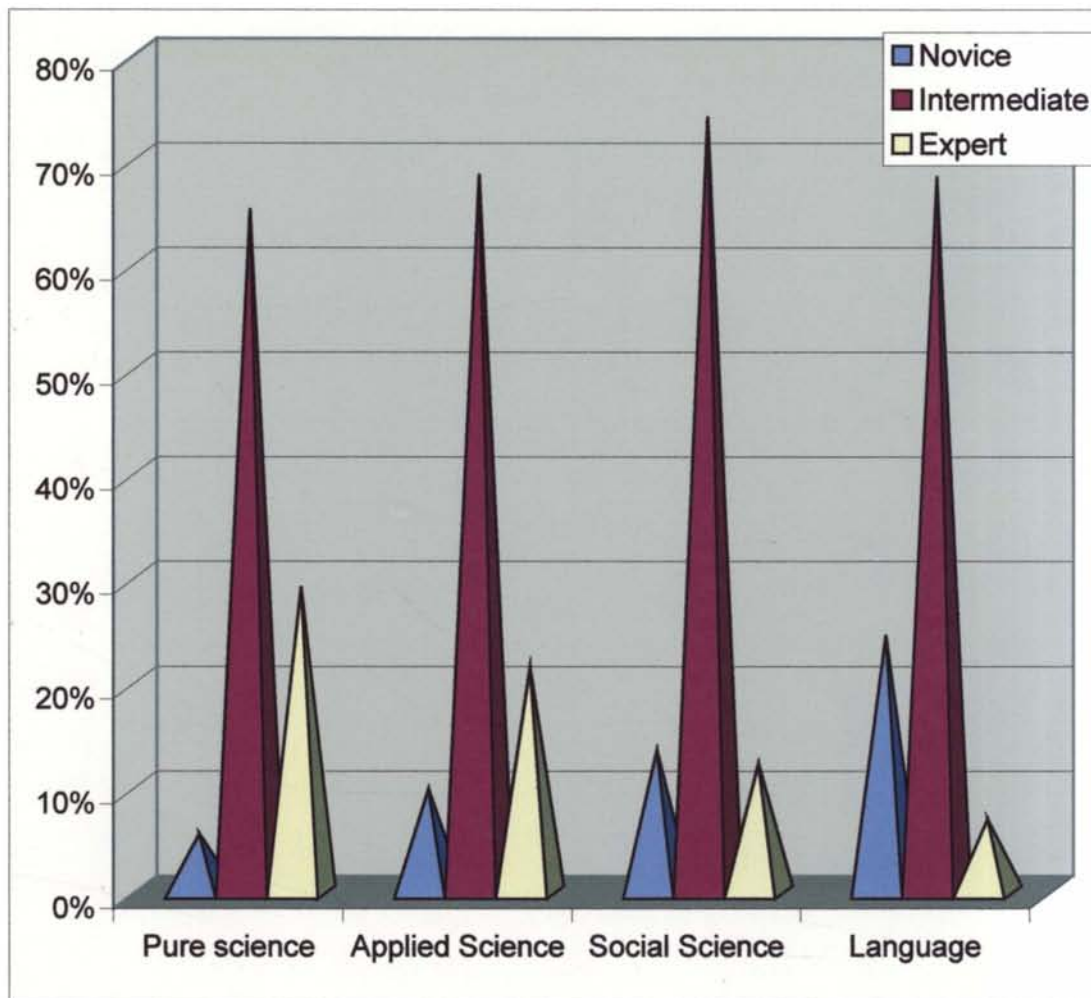
Table 5.6 portrays the level of internet literacy of the faculty members of various universities in Kerala. As seen in the table, majority (69.2%) were having a medium (intermediate) level of knowledge regarding internet. Experts in this regard were only 18.4%. Others (12.4%) were at the novice level with regard to knowledge and utilization of Internet.

**Table 5.6 Internet Literacy**

Discipline	Internet Literacy			Total
	Novice	Intermediate	Expert	
Pure Science	4	47	21	72
	5.6%	65.3%	29.2%	100.0%
Applied Science	12	83	26	121
	9.9%	68.6%	21.5%	100.0%
Social Science	11	60	10	81
	13.6%	74.1%	12.3%	100.0%
Language	14	39	4	57
	24.6%	68.4%	7.0%	100.0%
Total	41	229	61	331
	12.4%	69.2%	18.4%	100.0%

It is seen from the above table that irrespective of the various disciplines most of the faculty members were intermediates with respect to the internet literacy. Higher number of faculty members at the novice level is found in the discipline of Language with 24.6%. Experts on the other hand are seen prominently in the Pure Science discipline with 29.2%. Lowest representation in the expert category was found in the Language discipline with 7%. Probably, this variation might be due to the difference in the requirement of information of the faculty members.

**Figure 5. 2 Internet Literacy of faculty members**



**Awareness of Internet services**

There are various internet services. In order to find out the awareness of internet services among the faculty members, a question was posed and the analysis is given in the following table.



**Table 5.7 Awareness of various Internet services**

Internet Services	Pure science N-72	Applied science N-123	Social Science N-81	Language N-57	All F		Significance
					sample	value	
<b>E-Mail</b>	72	120	78	44	314	17.32	P<0.05 sig
	100%	99.2%	96.3%	77.2%	94.9%		
<b>WWW</b>	71	107	74	41	293	8.25	P<0.05 sig
	98.6%	88.4%	91.4%	71.9%	88.5%		
<b>Search Engines</b>	72	108	71	42	293	7.68	P<0.05 sig
	100.0%	89.3%	87.7%	73.7%	88.5		
<b>Remote login</b>	34	42	16	4	96	10.9	P<0.05 sig
	47.2%	34.7%	19.8%	7.0%	29%	7	
<b>File Transfer Protocol (FTP)</b>	35	53	21	9	118	7.72	P<0.05 sig
	48.6%	43.8%	25.9%	15.7%	35.6%		
<b>Archie</b>	20	26	15	9	70	1.07	P>0.05 non sig
	27.8%	21.5%	18.5%	15.7%	21.1%		
<b>Discussion groups</b>	39	53	34	14	140	3.96	P<0.05 sig
	54.2%	43.8%	41.9%	24.5%	42.3%		
<b>Bulletin Board service</b>	14	31	14	8	67	1.33	P>0.05 non sig
	19.4%	25.6%	17.3%	14.03%	20.2%		
<b>Frequently asked questions</b>	33	59	30	16	138	2.72	P<0.05 sig
	45.8%	48.7%	37.03%	28.07%	41.7		
<b>Chatting</b>	45	78	51	19	193	6.17	P<0.05 sig
	62.5%	64.4%	62.9%	33.3%	58.3%		

Table 5.7 depicting the awareness of the faculty members regarding the various internet facilities show that except on 'Bulletin Board Service' and 'Archie' most of them are aware about the other internet services such as E-mail, WWW, Search engines, FTP, Remote Login, Discussion Groups, Frequently Asked Questions and Chatting. The F values and the P values according to the discipline is found to be statistically significant for all the services except for the two mentioned above.

The frequencies under each discipline show that with respect to the E-mail most of the faculty members across the various disciplines (Pure science (100%), Applied Science (99.2%), Social Science (96.3%) and Language (77.2%) ) are aware about it. Lowest as seen in the table in this regard was reported from the Language discipline.

Awareness on WWW is reported by 88.5% of the total sample population ( N-331) which recorded significance at the F value 8.25. Pure science discipline is represented with more faculty members who reported awareness on WWW with 98.6%. Lowest in this regard is seen in among the faculty members of Language discipline with 71.9%.

Awareness on Search Engines is reported by 88.5% of the total sample population (N-331) which recorded significance at the F value 7.68. Cent percentage of Pure Science faculty members are aware of Search Engines. Lowest in this regard is seen among the faculty members of Language discipline with 73.7%.

Awareness on Remote Login and FTP according do different discipline is found to be significant with the F values of 10.97 and 7.72. 29% and 35.6% of the faculty members of all samples is reported to have awareness on the same. Here too the Pure science discipline is represented with more number of faculty members who are aware about the same. Lowest again is found in the Language discipline.

The faculty members in various universities of Kerala are considered to have been aware about the internet services like Discussion Groups, Frequently Asked Questions and Chatting. Their awareness according to the various disciplines is said to be significant with the F values 3.96, 2.72 and 6.17. In all these three services too it is seen that comparatively more faculty members from Pure Science, Applied Science and Social Science disciplines are aware about these than from the faculty members of the Language discipline.

Lowest awareness is reported by a higher number of faculty members of all the disciplines with respect to the internet services of Archie and Bulletin board services. The awareness according to the discipline is found to be statistically non significant with the corresponding F values of 1.07 and 1.33. As seen from the table the lowest percentage of awareness was reported in this regard with only 21.1% and 20.2% of the sample population reported awareness of the same.

### **Importance of Internet services**

The world at large is in a transition stage with drastic changes in information and communication fields. Correspondingly, a great deal of revolution has happened with respect to the education and information seeking behaviour of the faculty members. The present empirical study regarding the internet knowledge and utilization has attempted to view the importance the faculty members of various disciplines has given. Accordingly the table 5.8 presents the importance given by the faculty members to various services in the internet services.

**Table 5. 8 Importance of internet service**

	Pure science	Applied science	Social science	Language	All samples		
Internet Services	Mean R	Mean R	Mean R	Mean R	Mean R	T value	Significance
E-mail	1.17 9	1.23 9	1.27 9	1.61 9	1.29 9	45.408	P< 0.05 sig
External Library Catalogues	1.81 4	1.88 6	1.98 5	1.67 8	1.85 5	43.526	P< 0.05 sig
Bibliographic data base	1.54 7	1.92 5	1.98 5	1.91 5	1.85 5	41.729	P< 0.05 sig
Journals	1.31 8	1.60 8	1.57 8	1.79 6	1.56 8	38.319	P< 0.05 sig
E-Books	1.58 6	1.79 7	1.84 7	1.67 6	1.73 7	42.885	P< 0.05 sig
E-News papers	2.21 3	2.31 3	2.19 3	2.23 3	2.24 3	43.912	P< 0.05 sig
Downloading service	1.63 5	2.03 4	2.12 4	2.11 4	1.98 4	40.036	P< 0.05 sig
Discussion lists	2.26 2	2.55 2	2.65 2	2.46 2	2.50 2	52.999	P< 0.05 sig
Telnet connections	2.49 1	2.96 1	2.89 1	2.96 1	2.84 1	55.257	P< 0.05 sig

\* R – refers to rank

Table 5.8 which portrays the importance of internet services according to the faculty members of various disciplines show that all the services are found to be important as the ‘t’ values of all services are significant at 0.05

level. The ‘t’ values ranging between 55.257 for telnet connections to 38.319 for journals show a certain degree of convergence. Although all the services are

reported to be important for the faculty members, the Telnet connections, Discussion Lists and E-Newspapers are reported to be more important at the internet as they received ranks 1,2 and 3 respectively with the mean scores of 2.84, 2.50 and 2.24. The least rank i.e., 9<sup>th</sup> rank is received by 'E-mail'. Probably, the emergence of other electronic equipments for rapid communication might have reduced the importance of e-mail in this regard. Though received low rank the importance of the same is not ruled out as it is statistically significant at 0.05 level with the t value 45.40.

The table further reveals that in all the disciplines a similar trend of importance is received for all the services of the internet. In all disciplines, Telnet connections, Discussion Lists and E-Newspapers received First, Second and Third ranks. Downloading services obtained fourth rank by the Applied Science , Social Science, and Language disciplines. However, in the Pure science discipline downloading service was pushed to the fifth place with external library catalogue service occupying the 4<sup>th</sup> rank.

As seen in the table there is commonality in all the disciplines regarding the 9<sup>th</sup> rank as in all disciplines the least rank is occupied by E-mail. E-Journals, and E-books are the other services that received lower ranks.

Nevertheless, no disciplines undermine the importance of any of the services. Only the intensity of the importance is varying.

## Opinion on the influence of internet on Academic efficiency

**Table 5.9 Opinion on the influence of internet on Academic efficiency**

	Discipline					Total N-331	T value	Significance
	Pure science N-72	Applied science N-121	Social Science N-81	Language N-57				
<b>Opinion</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>				
<b>Decrease in conventional documents</b>	42	57	32	23	154	16.945	P<0.05 sig	
	58.3%	47.1%	39.5%	40.4%	46.5%			
<b>Increase in dependency on Internet</b>	60	97	58	44	259	34.454	P<0.05 sig	
	83.3%	80.2%	71.6%	77.2%	78.2%			
<b>Expedited research process</b>	49	67	49	30	195	21.752	P<0.05 sig	
	68.1%	55.4%	60.5%	52.6%	58.9%			
<b>Improved professional competence</b>	50	82	55	38	225	26.466	P<0.05 sig	
	69.4%	67.8%	67.9%	66.7%	68%			
<b>Access to updated information</b>	66	98	65	36	265	36.401	P<0.05 sig	
	91.7%	81.0%	80.2%	63.2%	80.1%			
<b>Access to wide range information</b>	68	101	68	41	278	41.605	P<0.05 sig	
	94.4%	83.5%	84.0%	71.9%	84%			
<b>Faster access</b>	62	103	64	39	268	37.467	P<0.05 sig	
	86.1%	85.1%	79.0%	68.4%	81%			
<b>Talk less on phone</b>	20	44	21	14	99	11.86	P<0.05 sig	
	27.8%	36.4%	25.9%	24.6%	29.9%			

Table 5.9 depicting the opinion of the faculty members of the various universities regarding the influence of the internet on academic efficiency highlight that most of the faculty members (84%) had access to a wide range of information on the internet and that majority (81%) had faster access to information through the internet. 80.1% state that they have access to updated information on the internet. However, only 46.5% of the opinion that the access to internet has decreased dependence on conventional documents. On the whole it could be noticed that the faculty members develop an increased dependency on internet in order to access information regarding various topics of their academics. The 't' values and their corresponding significance show that as the p-value show significance the opinion differs according to the different disciplines.

Further, the table show that among the faculty members of different disciplines, a higher number of faculties from Pure Science, Applied Science and Social Science are of the opinion that internet provide greater access to wide range of information, access to up dated information, and a faster access. Similarly, they stated an increased dependency on internet and expedited research process. The corresponding figure from the discipline of Language is comparatively lower. Nevertheless, a similar trend or similar opinion is noticed among the faculty members of various disciplines.

#### **Suitable time for browsing**

In order to find the most suitable time for browsing, six options were selected for marking such as morning, noon, evening, night, late night and whenever necessary. The table for the same is enumerated below.

**Table 5.10 Suitable time for browsing**

Time for browsing	CATEGORY				Total
	Pure Science	Applied Science	Social Science	Language	
<b>Morning</b>	13	9	7	5	34
	38.2%	26.5%	20.6%	14.7%	100.0%
	18.1%	7.4%	8.6%	8.8%	10.3%
<b>Noon</b>	2	6	3	2	13
	15.4%	46.2%	23.1%	15.4%	100.0%
	2.8%	5.0%	3.7%	3.5%	3.9%
<b>Evening</b>	2	4	1		7
	28.6%	57.1%	14.3%		100.0%
	2.8%	3.3%	1.2%		2.1%
<b>Night</b>	10	13	16	20	59
	16.9%	22.0%	27.1%	33.9%	100.0%
	13.9%	10.7%	19.8%	35.1%	17.8%
<b>Late night</b>	3	9	5	6	23
	13.0%	39.1%	21.7%	26.1%	100.0%
	4.2%	7.4%	6.2%	10.5%	6.9%
<b>Whenever necessary</b>	33	72	43	22	170
	19.4%	42.4%	25.3%	12.9%	100.0%
	45.8%	59.5%	53.1%	38.6%	51.4%
<b>Morning &amp; Evening</b>	9	8	6	2	25
	36.0%	32.0%	24.0%	8.0%	100.0%
	12.5%	6.6%	7.4%	3.5%	7.6%
<b>Total</b>	72	121	81	57	331
	21.8%	36.6%	24.5%	17.2%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%



Table 5.10 details the suitable time for browsing as reported by the faculty members. Most of the faculty members (51.4%) are of the opinion that they use it when a need arises and therefore cannot say a particular time as suitable time. However, among others good number (17.8%) opted 'night' as the most suitable time for browsing. 'Morning' as suitable time is reported by 10.3% of the faculty members across all the disciplines. 'Morning and evening' as the suitable time is mentioned by 7.6% of them

Discipline wise, it is noticed that most of the faculty members from Applied science stated either morning or noon time as the suitable time for browsing i.e., 46.2% and 57% respectively. Pure Science group mostly mentioned 'morning' as the suitable time. On the contrary, those belonging to the Language discipline stated night or late night as the suitable time for browsing. Among the Social Science discipline most cited morning and evening as the most suitable time.

On the whole, it is noticed the more than a specific time faculty members across all disciplines used it according to their requirements

## Quality of Students' work

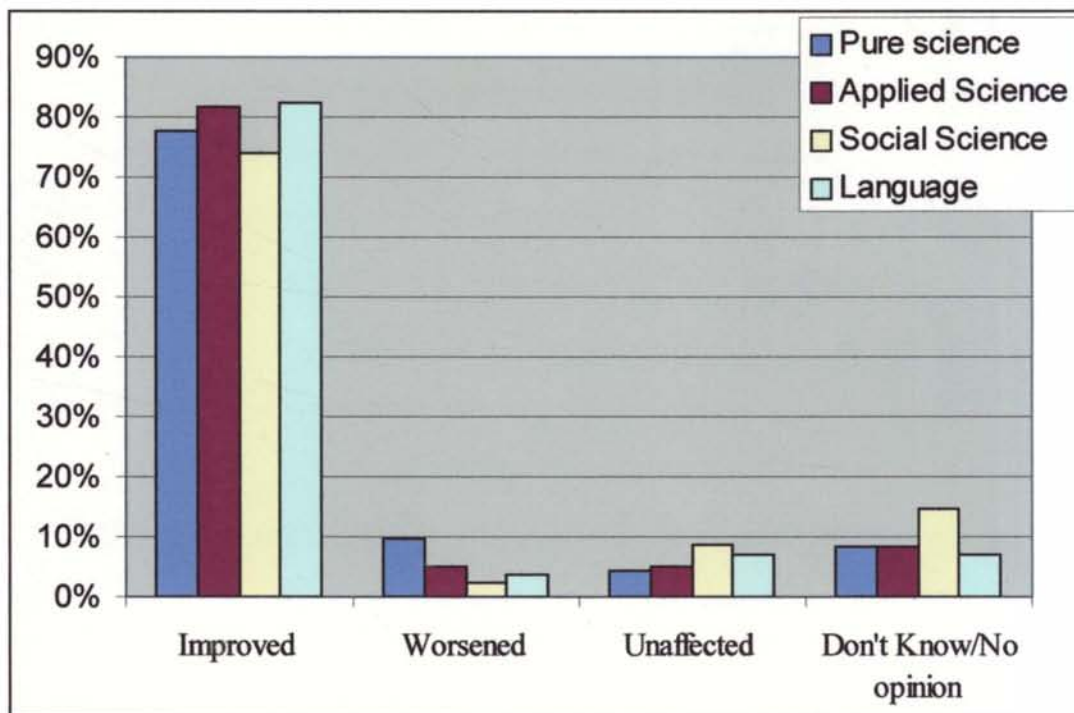
**Table 5. 11 Quality of Students' work**

Discipline	Quality of students' work due to Internet				Total
	Improved	Worsened	Unaffected	Don't Know/No opinion	
Pure Science	56	7	3	6	72
	77.8%	9.7%	4.2%	8.3%	100.0%
Applied Science	99	6	6	10	121
	81.8%	5.0%	5.0%	8.3%	100.0%
Social Science	60	2	7	12	81
	74.1%	2.5%	8.6%	14.8%	100.0%
Language	47	2	4	4	57
	82.5%	3.5%	7.0%	7.0%	100.0%
Total	262	17	20	32	331
	79.2%	5.1%	6.0%	9.7%	100.0%

Table 5.11 depicts the influence of internet on the quality of student's work . Accordingly, it is seen from the table that 79.2% of the faculty members are of the opinion that the internet assisted in improving the quality of the student's academic work. Among the others, 6% state that it neither improved or worsened the work of students. On the contrary, 5.1% are of the opinion that internet has worsened the quality of student's work. Probably, lack of proper knowledge on how to use internet, or lack of objective assessment of the contribution of internet or improper use of the internet that have lead to worse or low quality or work. 9.7% however , had no opinion regarding the quality of students' work due to internet. No much variation is noticed among the two sexes regarding the opinion on the improvement of the students' work with the assistance of internet.

It is seen from the table again that a higher number of faculty members from the Language and Applied Science discipline state improvement in the quality of student's work. The lowest in this regard is reported from the Social Science discipline with 74.1%. Among those who opined that the use of internet reduced or worsened the quality of students, Pure Science discipline outnumbered others with 9.7%. Least in this regard is reported from the Social Science category with 2.5%.

**Figure 5.3 Quality of Students' work**



The ANOVA test between the years of service and opinion on efficiency of students work and the 't' test between gender and opinion on efficiency of students work due to internet utilization too highlight that in both these, the two variables do not differ significantly as the obtained p value is much greater than the p value of 0.05. This shows that these variables are not interrelated.

## Contribution of internet

**Table 5.12 Contribution of internet in improving academic efficiency**

Discipline	Contribution of internet in academic efficiency			Total
	A great deal	A fair amount	A little	
Pure Science	45	21	6	72
	62.5%	29.2%	8.3%	100.0%
Applied Science	66	49	6	121
	54.5%	40.5%	5.0%	100.0%
Social Science	41	31	9	81
	50.6%	38.3%	11.1%	100.0%
Language	33	24	-	57
	57.9%	42.1%	-	100.0%
Total	185	125	21	331
	55.9%	37.8%	6.3%	100.0%

Table 5.12 highlighting the contribution of internet in improving academic efficiency show that cent percent agree regarding positive the contribution of internet in improving the efficiency. Nevertheless, they differ in the quantum of contribution. While majority (55.9%) affirmed that internet contributes a great deal, 37.8% state that it contributes a fair amount. However, for 6.3% internet contributed only a little for improving the academic efficiency.

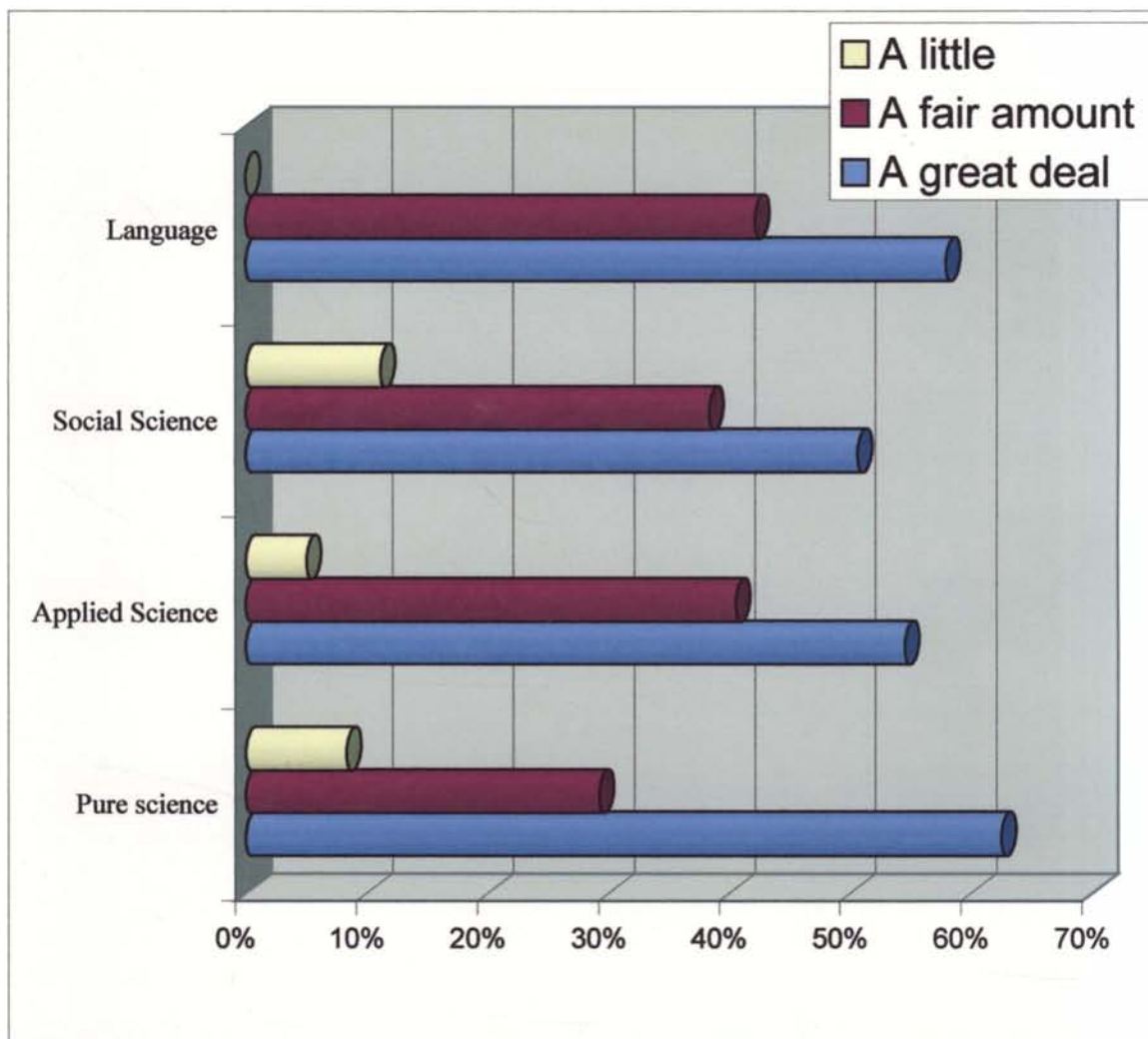
Pure Science discipline followed by Language and Applied Science disciplines affirmed about a great quantum of contribution in improving the

academic efficiency. Lowest in this regard is recorded from the Social Science discipline with 50.6%. Among those who mentioned “ a great deal of contribution” Language discipline followed by Applied Science category outnumbered all the others with 42.1% & 40.5% respectively. It was faculty members from the Social Science category that outnumbered the others with respect to the ones who mentioned “ a little’ contribution.

The results of chi square test to find out the association between gender and the opinion on the contribution of Internet in improving academic efficiency show that these two variables are not associated to each other. The chi-square value of 0.797 is significant at 0.671 which is greater than the p value of 0.05. This shows that that there is no statistically significant association between the gender and influence of internet in academic efficiency

However, chi square tests between age, years of service and the contribution of internet in improving academic efficiency show a significant association between them. The chi square values of 15.291 ( for age and contribution) and 42.272 ( for years of service and contribution) is found to be significant at the obtained p value of 0.018 and 0.000 which is lower than the p value of 0.05. The intensity of association is found to be greater with respect to years of service and the opinion on the contribution than that of age.

**Fig. 5.4 Contribution of internet in improving academic efficiency**



## Interaction through internet

**Table 5.13 Interaction of faculty members with students through Internet**

Discipline	Positive impact of internet communication					Total
	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	
Pure Science	27	29	14	2		72
	37.5%	40.3%	19.4%	2.8%		100.0%
Applied Science	27	66	18	7	3	121
	22.3%	54.5%	14.9%	5.8%	2.5%	100.0%
Social Science	18	47	13	3		81
	22.2%	58.0%	16.0%	3.7%		100.0%
Language	9	28	17	3		57
	15.8%	49.1%	29.8%	5.3%		100.0%
Total	81	170	62	15	3	331
	24.5%	51.4%	18.7%	4.5%	.9%	100.0%

Internet is used not only for information purpose rather it is widely used for communication and interaction as it is considered the cheapest mode of communication. Table 5.13 highlights the extent to which the faculty members agree regarding the positive influence of such interaction between the students on the internet. Their assessment is rated on a five point scale depending on their level of agreement. Accordingly, 51.4% of the faculty members agreed that interaction of the faculty with the students through internet had a positive influence on them. Another 24.5 % strongly agreed on the positive influence of the same. Those who disagreed or strongly disagreed to the positive influence were only 5.4% of the total sample population of 331 faculty members. 18.7% are neutral on the statement as they could

not make up their mind to either of the sides. On the whole, the data exhibits an emphatic positive influence of the internet communication medium.

The table further displays that irrespective of the discipline variations, most of the faculty members have expressed the positive influence/impact ( Agree + Strongly agree together) of internet communication between them and the students. Highest in this regard was reported from the Social science discipline followed by Applied science. Among those who disagreed or strongly disagreed are the faculty members from the Applied science with 8.3% followed by the faculty members of the Language category with 5.3%. Those who stayed neutral on the influence were comparatively higher in the Language discipline with 29.8% , seconded by the Pure Science category with 19.4%.



**Table 5.14 Correlation**

**Correlations**

		<b>Gender</b>	<b>Category</b>	<b>Age of the respondent</b>	<b>Years of service</b>	<b>Value</b>
<b>Gender</b>	<b>Pearson Correlation</b>	1	.176(**)	-.177(**)	-.120(*)	.069
	<b>Sig. (2-tailed)</b>	.	.001	.001	.029	.212
	<b>N</b>	331	331	331	331	331
<b>Discipline</b>	<b>Pearson Correlation</b>	.176(**)	1	-.209(**)	-.176(**)	.110(*)
	<b>Sig. (2-tailed)</b>	.001		.000	.001	.045
	<b>N</b>	331	331	331	331	331
<b>Age of the respondent</b>	<b>Pearson Correlation</b>	-.177(**)	-.209(**)	1	.772(**)	-.053
	<b>Sig. (2-tailed)</b>	.001	.000	.	.000	.335
	<b>N</b>	331	331	331	331	331
<b>Years of service</b>	<b>Pearson Correlation</b>	-.120(*)	-.176(**)	.772(**)	1	.040
	<b>Sig. (2-tailed)</b>	.029	.001	.000	.	.465
	<b>N</b>	331	331	331	331	331
<b>Impact of internet communication</b>	<b>Pearson Correlation</b>	.069	.110(*)	-.053	.040	1
	<b>Sig. (2-tailed)</b>	.212	.045	.335	.465	
	<b>N</b>	331	331	331	331	331

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

The co-relation between the variables gender, discipline, age of the respondents, years of service and the influence of interaction of faculty members with students on internet show that only the correlation between the disciplines and the influence is found to be related, all the other variables are not find to be significantly related to the positive influence of interaction of faculty members with the students on the internet. The Pearson co-relation value between the positive influence and category/disciplines is 0.110 and is significant 0.05 level with the obtained value of 0.045.

### Self rating of internet skills

**Table 5.15 Self rating of level of internet skills**

Discipline	Self rating of level of internet skills					Total
	Very High	High	Average	Low	Not stated	
Pure Science	9	38	23	2		72
	12.5%	52.8%	31.9%	2.8%		100.0%
Applied Science	8	39	63	11		121
	6.6%	32.2%	52.1%	9.1%		100.0%
Social Science	3	23	49	5	1	81
	3.7%	28.4%	60.5%	6.2%	1.2%	100.0%
Language	1	13	35	8		57
	1.8%	22.8%	61.4%	14.0%		100.0%
Total	21	113	170	26	1	331
	6.3%	34.1%	51.4%	7.9%	.3%	100.0%

Table 5.15 show the level of the skill of the faculty members in relation to internet using. The level of their skills are adjudged by the faculties

themselves. Accordingly, the data show that most (51.4% ) adjudged their skills at an average level. 34.1% assessed that they have high skills in utilizing the internet. Low skills are mentioned by 7.9%. Only a very low percent stated that they have very high skills or in other words adjudged themselves as experts in using internet for various purposes.

The chi square tests between Disciplines, Gender, Years of service and the level of internet skills show a significant association between these variables.

The calculated Pearson Chi square value of 33.959 between the Level of Internet skills and different discipline is found to be significant at the obtained p value of 0.01. Similarly, that of Gender, Years of services and internet skills is found to be significantly associated to each other as the obtained p values of 0.017 and 0.026 is lesser than the p value of 0.05. The calculated Chi square values of the same are 12.043 for Gender and 28.727 for the years of Service and level of internet skills.

It is thus inferred from the data that the skills on internet varies according to discipline, sex and the years of service.

However, the association between age and the level of skills is not significantly associated with each other as the chi –square value of 13.825 is not significant at the obtained p value of 0.312.

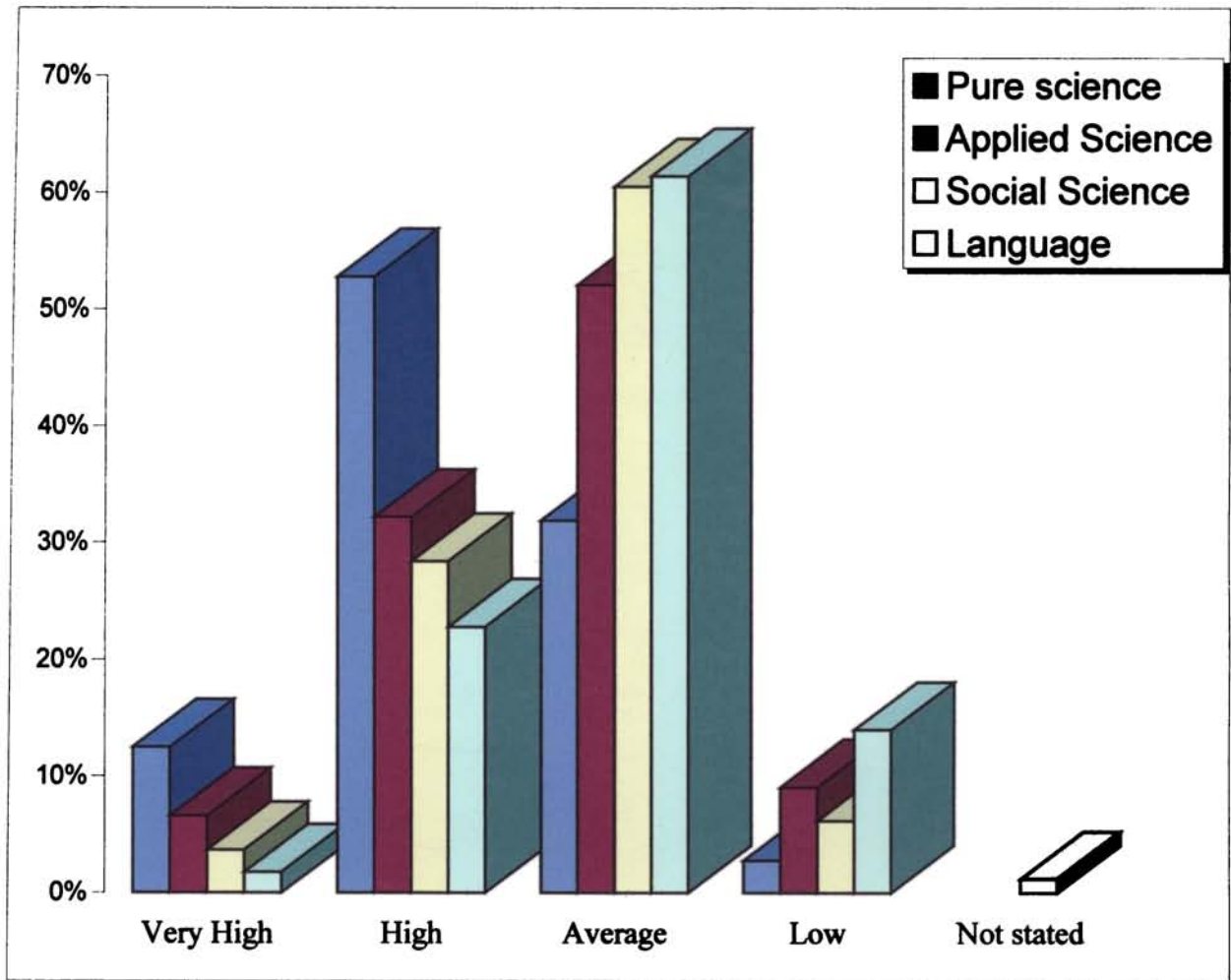
**Table 5. 16 Chi Square Tests of Internet skills**

	<b>Pearson Value</b>	<b>Chi-square</b>	<b>df</b>	<b>Asymp.Sig (2 sided)</b>
<b>Disciplines Vs Level of internet Skills</b>	33.959(a)		12	.001
<b>Gender Vs Level of internet Skills</b>	12.043(a)		4	.017
<b>Years of Service Vs Level of internet Skills</b>	28.727(a)		16	.026
<b>Age Vs Level of internet Skills</b>	13.825(a)		12	.312

Moreover the co-relation values between the knowledge level and the level of skills in internet show a significant relation between the two variables. The co-relation value of .382 is found to be significant at 0.01 level as the obtained p value is 0.00, it is assumed that as the knowledge about internet increases the level of skills too increases.

High level of skills are adjudged by a higher number of faculty members of the Pure Science discipline with 52.8% followed by Applied Science discipline with 32.2%. Similarly, average level of skills is reported comparatively higher by those from the discipline of Language with 61.4% followed by Social Science and Applied Science with 60.5% and 52.1%. respectively. Low level of skills in internet is adjudged more by the faculty members from the Language discipline with 14%. On the other, those with very high skills is found to be more in the Pure Science discipline with 12.5% followed by Applied Science with 6.6%.

**Fig. 5.5 Self rating of level of internet skills**



### Section C Attitude of faculty members towards Internet

The internet attitude scale was developed by Yixin Zhang, with four components such as enjoyment, efficacy, anxiety and usefulness.

**Table 5.17 Enjoyment of faculty members on internet**

Discipline	Enjoyment of internet				Total
	Low	Medium	High	Highest	
Pure Science		3	43	26	72
		4.2%	59.7%	36.1%	100.0%
Applied Science	1	1	86	33	121
	.8%	.8%	71.1%	27.3%	100.0%
Social Science	1	6	49	25	81
	1.2%	7.4%	60.5%	30.9%	100.0%
Language			49	8	57
			86.0%	14.0%	100.0%
Total	2	10	227	92	331
	.6%	3.0%	68.6%	27.8%	100.0%

The scores of enjoyment in relation to internet depicts that 68.6% of them had secured 25-32 indicating high enjoyment followed by 27.8% scoring between 32-40 meaning highest enjoyment. Those who scored below 25 score i.e., medium and low enjoyment of internet was reported only minimal

Distribution according to category show that enjoyment at the lower level i.e., scoring below 25 was reported only from the categories of Applied

Science and Social Science with 1.6% and 8.6% respectively. In all the other disciplines cent percent had secured above 25 marks depicting high or highest level of enjoyment.

**Table 5.18 Usefulness of the internet**

**Usefulness of the internet**

Discipline	usefulness			Total
	Medium	High	Highest	
Pure Science	6	48	18	72
	8.3%	66.7%	25.0%	100.0%
Applied Science	9	97	15	121
	7.4%	80.2%	12.4%	100.0%
Social Science	5	62	14	81
	6.2%	76.5%	17.3%	100.0%
Language	7	46	4	57
	12.3%	80.7%	7.0%	100.0%
Total	27	253	51	331
	8.2%	76.4%	15.4%	100.0%

Excluding 8.2% of the respondents all the others in the study had scored more than 25 marks with respect to the query on usefulness of internet. This indicated that majority found the internet as very useful.

Discipline wise distribution of the figures as seen in table no. depict that in all disciplines more than 90% of the respondents stated either high or highest level of usefulness as they scored more than 25. Comparatively the Language discipline had more in the medium/average usefulness category with 12.3%.

**Table 5.19 Anxiety according to discipline**

**Anxiety according to Discipline**

Discipline				Total
	Medium	High	Highest	
Pure Science	5	55	12	72
	6.9%	76.4%	16.7%	100.0%
Applied Science	3	105	13	121
	2.5%	86.8%	10.7%	100.0%
Social Science	1	70	10	81
	1.2%	86.4%	12.3%	100.0%
Language	2	51	4	57
	3.5%	89.5%	7.0%	100.0%
Total	11	281	39	331
	3.3%	84.9%	11.8%	100.0%

Here, the higher the score means lesser the anxiety. Accordingly the figures show that most of the respondents exhibited less anxiety as percent scored more than 25. None reported either high or highest anxiety i.e., scoring less than 17.

According to discipline wise distribution too not much variations is seen as those with less anxiety was reported greater in number in all disciplines



**Table 5. 20 Efficacy according to discipline**

**Efficacy according to discipline**

Disciplines	Efficacy				Total
	Low	Medium	High	Highest	
Pure Science		14	53	5	72
		19.4%	73.6%	6.9%	100.0%
Applied Science		26	86	9	121
		21.5%	71.1%	7.4%	100.0%
Social Science	1	15	59	6	81
	1.2%	18.5%	72.8%	7.4%	100.0%
Language		8	46	3	57
		14.0%	80.7%	5.3%	100.0%
Total	1	63	244	23	331
	.3%	19.0%	73.7%	6.9%	100.0%

With respect to the efficacy of internet use it is seen from the table that compared to the other components of internet usage, the number of those who recorded highest score was low. Yet, a good number i.e., 80.6% scored more than 25 indicating high and higher level efficacy. Medium and low level of efficacy i.e., below 25 is reported by 19% and 0.3% respectively.

Discipline-wise distribution show that those from language discipline had comparatively higher number who recorded more than 25 meaning high/higher efficacy level. Highest with respect to medium level of efficacy

(score between 17-24) is reported by those in the Applied Science category with 21.5%.

**Table 5. 21 Attitude based on enjoyment, efficacy, anxiety and usefulness**

<b>Components</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>	<b>Highest</b>
<b>Enjoyment</b>	2	10	227	92
	0.6	3.0	68.6	27.8
<b>Efficacy</b>	1	63	244	23
	0.3	19.0	73.7	6.9
<b>Anxiety</b>		11	281	39
		3.3	84.9	11.8
<b>Usefulness</b>		27	253	51
		8.2	76.4	15.4

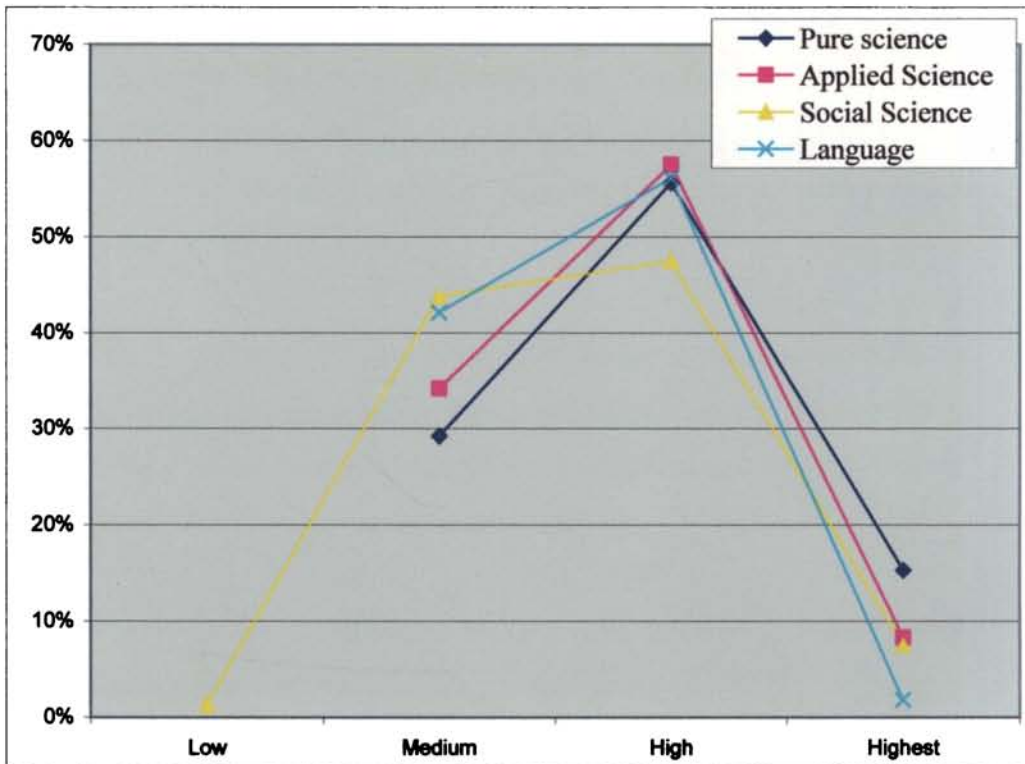
Table 5.21 shows the Attitude of the faculty members towards Internet in terms of all the four components viz., enjoyment, efficacy, anxiety and usefulness. The scores obtained by the respondents show that most of them had either high or higher positive attitude towards Internet use. Among the components the number of those who scored above 25 (high and higher efficacy) was comparatively low with 80.6%. Among all the other components more than 90% had responded high or higher efficacy.

**Table 5.22 Attitude towards internet facilities according to disciplines**

Disciplines	Attitude				Total
	Low	Medium	High	Highest	
Pure Science		21	40	11	72
		29.2%	55.6%	15.3%	100.0%
Applied Science		41	69	10	120
		34.2%	57.5%	8.3%	100.0%
Social Science	1	35	38	6	80
	1.3%	43.8%	47.5%	7.5%	100.0%
Language		24	32	1	57
		42.1%	56.1%	1.8%	100.0%
Total	1	121	179	28	329
	.3%	36.8%	54.4%	8.5%	100.0%

Table 5.22 portraying the attitude level according to various disciplines show that those who score high or higher score indicating better attitude towards internet use was comparatively high among the Pure Science respondents with 70.9%. Lowest in this regard was reported by Social Science group with 55%. Those who secured medium score (88-112) was reported from Social Science group with 43.8%. Those from Language group followed it with 42.1%. Those who secured highest between 136-160 was reported highest by the Pure Science group with 15.3% followed by Applied Science category with 8.3%.

**Fig. 5.6 :Attitude towards internet facilities according to disciplines**



**Table 5.23 Attitude towards internet by the faculty members of various disciplines**

Components	Pure science		Applied Science		Social Science		Langu- age		All samples		T value	Significance
	M	R	M	R	M	R	M	R	M	R		
<b>Enjoyment</b>	31.5	1	30.85	1	30.52	1	30.15	1	118.6	1	70.152	P<.05 sig
<b>Usefulness</b>	30.20	2	29.05	3	29.25	2	28.45	3	116.6	2	110.89	P<.05 sig
<b>Anxiety</b>	29.18	3	29.20	2	29.18	3	29.07	2	116.3	3	70.541	P<.05 sig
<b>Efficacy</b>	27.70	4	27.53	4	27.39	4	26.98	4	114.6	4	101.94	P<.05 sig

The attitude level of the faculty members of various universities in Kerala towards the utilization of internet facilities show that all the four component of the attitude scale viz., enjoyment, usefulness, anxiety and efficacy are significant at 0.05 level for all the sample population (N-331) The highest rank among the four components is obtained by the enjoyment component with the t value 118.6, followed by usefulness, anxiety and efficacy with t values 116.6, 116.3 and 114.6.

Within the different disciplines too a similarity or convergence is found among the four components as enjoyment obtained 1<sup>st</sup> rank in all disciplines with a mean ranging between 31.5 and 30.15. Usefulness and anxiety is found to have slight variation among the various disciplines.

Yet, an overview of the attitude present a positive attitude towards internet utilization as all the components are significant.

**Table 5.24 Gender-wise distribution of the Attitude towards internet utilization**

Gender	Attitude				Total
	Low	Medium	High	Highest	
Male	1	61	96	15	173
	.6%	35.3%	55.5%	8.7%	100.0%
Female		60	85	13	158
		38.0%	53.8%	8.2%	100.0%
Total	1	121	181	28	331
	.3%	36.6%	54.7%	8.5%	100.0%

Table showing the gender-wise distribution of the attitude level picture that comparatively more number of males (64.2%) reported either high or higher level of positive attitude towards internet use. Females in this regard constituted only 61%. Medium level of attitude ( those scored between 88-112) is reported by a slightly higher number of females than males. Low score is reported only from males and that too only by a nominal number i.e., 0.6%.

However, the test between the attitude level and the gender of the faculty members indicate that the attitude does differ significantly with respect to the gender. The calculated t value is found to be non significant as the obtained p value i.e., 0.615 is much greater than 0.05.

**Table 5.25 ANOVA table showing the attitude level according to the years of service**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	2120.066	4	530.016	3.431	.009
<b>Within Groups</b>	50045.484	324	154.461		
<b>Total</b>	52165.550	328			

The ANOVA table between the years of service and the attitude level displays that the attitude differ significantly according to the years of service. The F value 3.431 is found to significant at the obtained p value of 0.009 which is lesser than the p value of 0.05.

## Section D

Section D attempts to find out the practice level of faculty members.

### Period of utilization of internet

**Table 5.26 Period of Utilization of the Internet Services according to various disciplines**

Discipline	Period of using the internet services					Total
	Less than 6 months	6 months - 1 year	1-2 yrs	2-4 yrs	More than 4 yrs	
Pure Science	5			5	62	72
	6.9%			6.9%	86.1%	100.0%
	16.1%			13.9%	25.0%	21.8%
Applied Science	7		4	10	100	121
	5.8%		3.3%	8.3%	82.6%	100.0%
	22.6%		36.4%	27.8%	40.3%	36.6%
Social Science	4	1	2	11	63	81
	4.9%	1.2%	2.5%	13.6%	77.8%	100.0%
	12.9%	20.0%	18.2%	30.6%	25.4%	24.5%
Language	15	4	5	10	23	57
	26.3%	7.0%	8.8%	17.5%	40.4%	100.0%
	48.4%	80.0%	45.5%	27.8%	9.3%	17.2%
Total	31	5	11	36	248	331
	9.4%	1.5%	3.3%	10.9%	74.9%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5.26 depicts the duration or the period in which the faculty members of various universities in Kerala are using internet services. Accordingly it is seen from the table that majority of the faculty members (74.9%) across the various disciplines are using the various services of the internet for more than 4 years. Those who are using it for a period less than 1 year constitute 10.9% of the sample population. Among the others, 3.3% and 10.9% each are using the same for 1-2 yrs and 2-4 yrs respectively. It infers that a good number of the faculty members are at the novice stage of using the services of the internet either for communication or information.

The table further highlights that those who avail the services of the internet for a longer duration hail mostly from the Pure Science, Applied Science and Social Science disciplines when compared to the Language discipline wherein only 40.4% are using it for more than 4 years. Pure Science discipline closely followed by the Applied Science discipline figured prominently with 86.1% and 82.6% of the faculty members using the services for more than 4 years. The initial users or who are using it for a period less than 1 years are prominently seen in the Language discipline. Applied Science and Social Science disciplines is reported to have lesser number of novices with respect to the utilization of the various services in the internet.

The ANOVA test statistics of the duration of the utilization of the services according to various discipline reveal that the duration differed significantly according to the disciplines. The F value 18.084 is Significant at the p value of .05



**Table 5.27 ANOVA for duration of the utilization of the internet services according the disciplines**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	71.683	3	23.894	18.084	.000
<b>Within Groups</b>	432.069	327	1.321		
<b>Total</b>	503.752	330			

Nevertheless, the variation with respect to gender is found to be insignificant as the t value .887 between the utilization of the internet services according to gender was found to be insignificant at .376 which is higher than the p value of .05.

Similarly, the ANOVA table between the utilization of services according to the age of the faculty members is also found to be insignificant at the F value is 0.605 and the significant value is 0.437. This shows that the utilization does not differ significantly according to the variation in the ages.

## Frequency of using internet

**Table 5. 28 Discipline wise distribution of the frequency of internet service uses**

Discipline	Frequency of using Internet services					Total
	Rarely	Daily	2-3 times a week	2-3 times in a month	Once in a month	
Pure Science		54	8	5	5	72
		75.0%	11.1%	6.9%	6.9%	100.0%
		30.7%	8.6%	15.2%	21.7%	21.8%
Applied Science	1	80	32	5	3	121
	.8%	66.1%	26.4%	4.1%	2.5%	100.0%
	16.7%	45.5%	34.4%	15.2%	13.0%	36.6%
Social Science		28	37	10	6	81
		34.6%	45.7%	12.3%	7.4%	100.0%
		15.9%	39.8%	30.3%	26.1%	24.5%
Language	5	14	16	13	9	57
	8.8%	24.6%	28.1%	22.8%	15.8%	100.0%
	83.3%	8.0%	17.2%	39.4%	39.1%	17.2%
Total	6	176	93	33	23	331
	1.8%	53.2%	28.1%	10.0%	6.9%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5.28 throws light into the frequency of the use of internet by the faculty members of various disciplines. 'Daily users' outnumbered all the others in this regard with 53.2%. Those who use the internet 2-3 times a week

followed the above with 28.1%. The frequency of use of internet by a good number of faculty members pointed to the importance of internet for either communication or information. The number of those who use it less frequently i.e. either monthly or 2-3 times in a month constituted 16.9%. However, 1.8% of the faculty members reported that they had recourse to internet only rarely. Probably, lack of knowledge/information on the horizon of information facilities available in the internet has reduced the frequency of its use for communication and information purposes by the non frequenters.

The table above also indicates that it is the faculty members from Applied Science discipline who frequented i.e. daily and weekly, the internet browsing for either communication or information. 92.5% of the faculty members from this discipline is reported to have been using internet either daily or 2-3 times a week. Applied science is a branch which is developing at a faster speed with new applications and methodologies. May be this emerging evolutions and developments that attract the faculty members of Applied Science to the internet use in order to equip them with the world scenario of their science branch. The Pure Science category closely followed the above with 86.1%. Less frequent users of internet is seen among the faculty members of Language and Social Science disciplines. The rare users of the internet is reported at a higher rate from the Language discipline with 8.8%

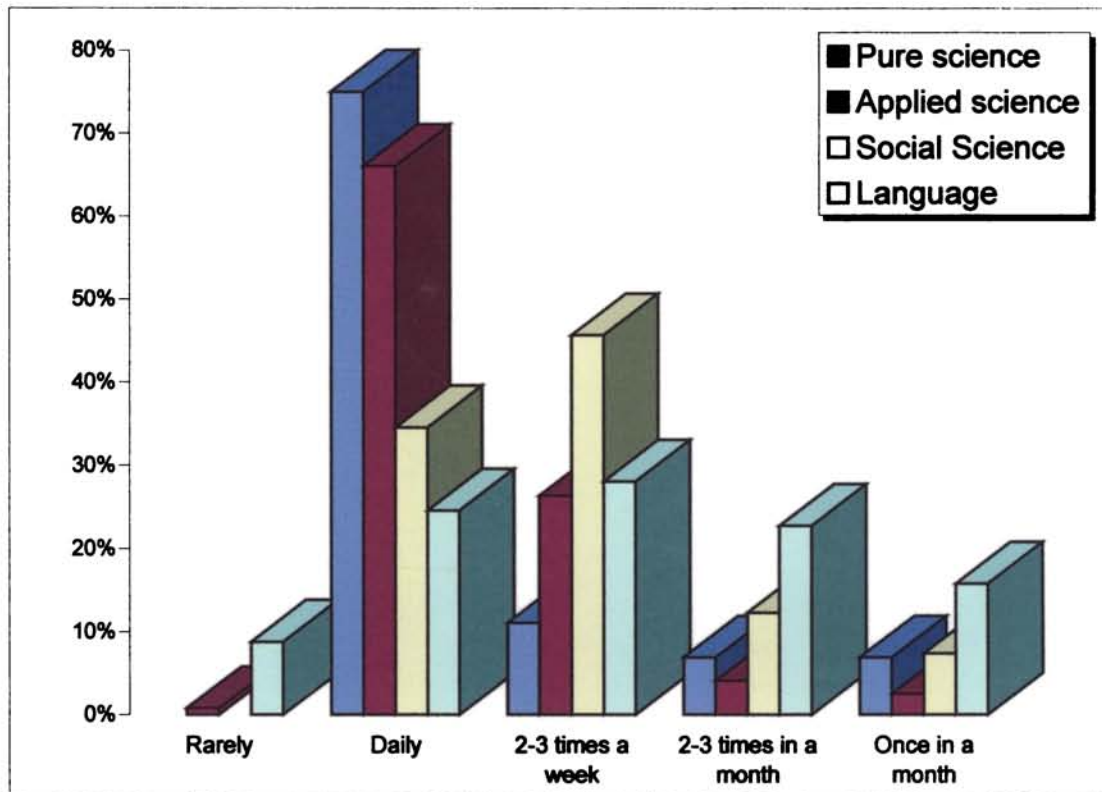
**Table 5.29 ANOVA for discipline of faculty members and the frequency of using internet services**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	28.196	3	9.399	11.779	.000
<b>Within Groups</b>	260.910	327	.798		
<b>Total</b>	289.106	330			

The ANOVA table below too indicates that the disciplines vary or differ significantly in their frequency of use of Internet as the p value .000 is less than the significant value of 0.05.

Similarly, the t- test of the frequency of internet use according to gender too show that the frequency of internet use differs according to gender variation as the t value  $-2.251$  is significant at .025 which is lower than the significant p value of .05.

**Fig. 5.7 Frequency of using internet services**



## Time spent for browsing internet

Table 5.30 Time spent for browsing internet

Discipline	Time spent for browsing internet							Total
	When required (irregular)	Less than 1 hr a week	2-4 hrs a week	5-6 hrs a week	7-9 hrs a week	10-20 hrs a week	Over 20 hrs a week	
Pure Science	1	6	15	17	12	13	8	72
	1.4%	8.3%	20.8%	23.6%	16.7%	18.1%	11.1%	100.0%
	7.1%	12.8%	13.2%	30.9%	27.3%	35.1%	40.0%	21.8%
Applied Science	1	13	49	19	20	11	8	121
	.8%	10.7%	40.5%	15.7%	16.5%	9.1%	6.6%	100.0%
	7.1%	27.7%	43.0%	34.5%	45.5%	29.7%	40.0%	36.6%
Social Science	3	17	31	10	9	9	2	81
	3.7%	21.0%	38.3%	12.3%	11.1%	11.1%	2.5%	100.0%
	21.4%	36.2%	27.2%	18.2%	20.5%	24.3%	10.0%	24.5%
Language	9	11	19	9	3	4	2	57
	15.8%	19.3%	33.3%	15.8%	5.3%	7.0%	3.5%	100.0%
	64.3%	23.4%	16.7%	16.4%	6.8%	10.8%	10.0%	17.2%
Total	14	47	114	55	44	37	20	331
	4.2%	14.2%	34.4%	16.6%	13.3%	11.2%	6.0%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5.30 portraying the duration spent for internet browsing for information and communication purposes it is seen that 51% reports that they spent 2-6 hrs a week for the same. More than 7 hours per week was spent by 30.5% of the faculty members across the various disciplines. Those who spent less than 1 hour per week is reported by 14.2%.

Discipline wise figures show that among those who spent more than 7 hours per week for browsing, the faculty members from Applied Science outnumbered other disciplines. Among the 7-9 hours users the applied science category topped the list with 45.5% followed by Pure science with 27.3%. Of those who spent more than 20 hrs for browsing the Applied science and pure science categories equaled with 40%. The least with respect to the users of internet for more than 7 hrs is found to be from the language discipline. While the irregular users were seen at a higher rate in the language discipline with 64.3%, less than 1 hours users were reported comparatively higher by the social science discipline with 36.2%. 2-6 hours per week is spent for browsing by a greater number of faculty members from the Applied science followed by Social science group with 50.6%.

It is thus explicit that the number of faculty members who spent long hours on the internet for either eliciting information or for communication was comparatively low. Probably, less awareness on the potentialities of internet or the lack of proper facilities might have contributed to this.

### Place and mode of accessing internet

**Table 31 : Place and mode of internet connection**

Place	Not using any	Dial up	Broadband	Leased Line	Broadband & Dial up
<b>At work place</b>	122	30	119	29	31
	36.8%	9.06%	35.9%	8.8%	9.4%
<b>At University library</b>	241	5	61	17	7
	72.8%	1.5%	18.4%	5.1%	2.1%
<b>At department library</b>	259	11	46	9	6
	78.2%	3.3%	13.9%	2.7%	1.8%
<b>At home</b>	121	91	78	6	35
	36.5%	27.5%	23.6%	1.8%	10.6%
<b>Other places</b>	294	11	19	3	4
	88.8%	3.3%	5.7%	0.9%	1.2%

The table on the type of internet browsing frequently used in different places show that 'dial up system' is used comparatively by a higher percentage (27.5%) of the faculty members at home. Yet another 10.6% of the faculty members used both broadband and dial up systems for the internet browsing at home. Whereas in the case of broadband a greater number (35.9%) of faculty members used it at the work place. 'Leased time' is used by a higher percentage of the faculty members at the workplace.

Those who did not use any of the internet methods the 'Department Library' topped the list with 78.2% followed by 72.8% of the internet in the university library

Dial up system, is found to be used only by a small percent of those at work place, department library and university libraries.

Similarly, broadband system too is found to be at a lower rate at the university library, department library and at home with 18.4%, 13.9% and 23.6% respectively.

Leased line is found to be used only by less than 10% of the faculty members across the various workplaces.

It is thus seen that the major two modes of internet browsing are dial up and broad band methods. Moreover, dial up system is used mostly at home while broad band is used at the workplace. Not much variation is noticed across the various disciplines under study.



## Mode of learning internet

**Table 5.32 Mode of learning Internet Skills**

Category	Trial & Error method	Guidance from colleagues	Training from University	Self instruction	Online Instruction	Reading	External Course	Multiple sources
	<b>YES</b>							
<b>Pure science</b>	33	37	11	34	20	28	1	8
	45.8%	51.4%	15.3%	47.2%	27.8%	38.9%	1.4%	11.1%
<b>Applied Science</b>	60	65	8	45	29	27	3	26
	49.6%	53.7%	6.6%	37.2%	24.0%	22.3%	2.5%	21.5%
<b>Social Science</b>	41	47	6	19	7	8	8	17
	50.6%	58.0%	7.4%	23.5%	8.6%	9.9%	9.9%	21.0%
<b>Language</b>	26	30	4	14	7	12	4	11
	45.6%	52.6%	7.0%	24.6%	12.3%	21.1%	7.0%	19.3%
<b>Total</b>	<b>160</b>	<b>179</b>	<b>29</b>	<b>112</b>	<b>63</b>	<b>75</b>	<b>16</b>	<b>62</b>
	48.3%	54.1%	8.8%	33.8%	19.0%	22.7%	4.8%	18.7%

People across the world use different methods to learn or to acquire internet skills in order to use it for various purposes. Table 5.32 shows that 54.1% of faculty members received assistance guidance from their colleagues for acquiring the internet skills. Trial and error method was the second mode used by a good number for learning internet skills. 48.3% of faculty members had recourse to this. The other methods included self learning (33.8%), reading (22.7%), online instruction (19%), training from university (8.8%), external courses (4.8%) and multiple sources (18.7%).

A look at the discipline wise distribution of the learning methods portrays that in all the four categories, most of the faculty members resorted to trial and error method and guidance from colleagues for obtaining skills regarding internet. Self learning/instruction is the third method which has been used by the faculty members in this regard. All the other methods were used by only a limited number of faculty members across all the disciplines.

It is thus seen that there is a homogeneity or convergence with respect to the medium that the faculty members used to acquire or obtain internet skills.

### Information seeking activities

**Table 5.33 Information seeking activities in Internet**

N-331

Discipline	Research & Education	Publication information	Lecture preparation	Job information	Seminar information	Library information services
	<b>Yes</b>					
<b>Pure science</b>	72	63	57	28	64	44
	100.0%	87.5%	79.2%	38.9%	88.9%	61.1%
<b>Applied Science</b>	108	70	83	36	83	58
	89.3%	57.9%	68.6%	29.8%	68.6%	47.9%
<b>Social Science</b>	73	46	59	26	56	33
	90.1%	56.8%	72.8%	32.1%	69.1%	40.7%
<b>Language</b>	52	28	34	27	42	24
	91.2%	49.1%	59.6%	47.4%	73.7%	42.1%
<b>Total</b>	<b>305</b>	<b>207</b>	<b>233</b>	<b>117</b>	<b>245</b>	<b>159</b>
	92.1%	62.5%	70.4%	35.3%	74.0%	48.0%

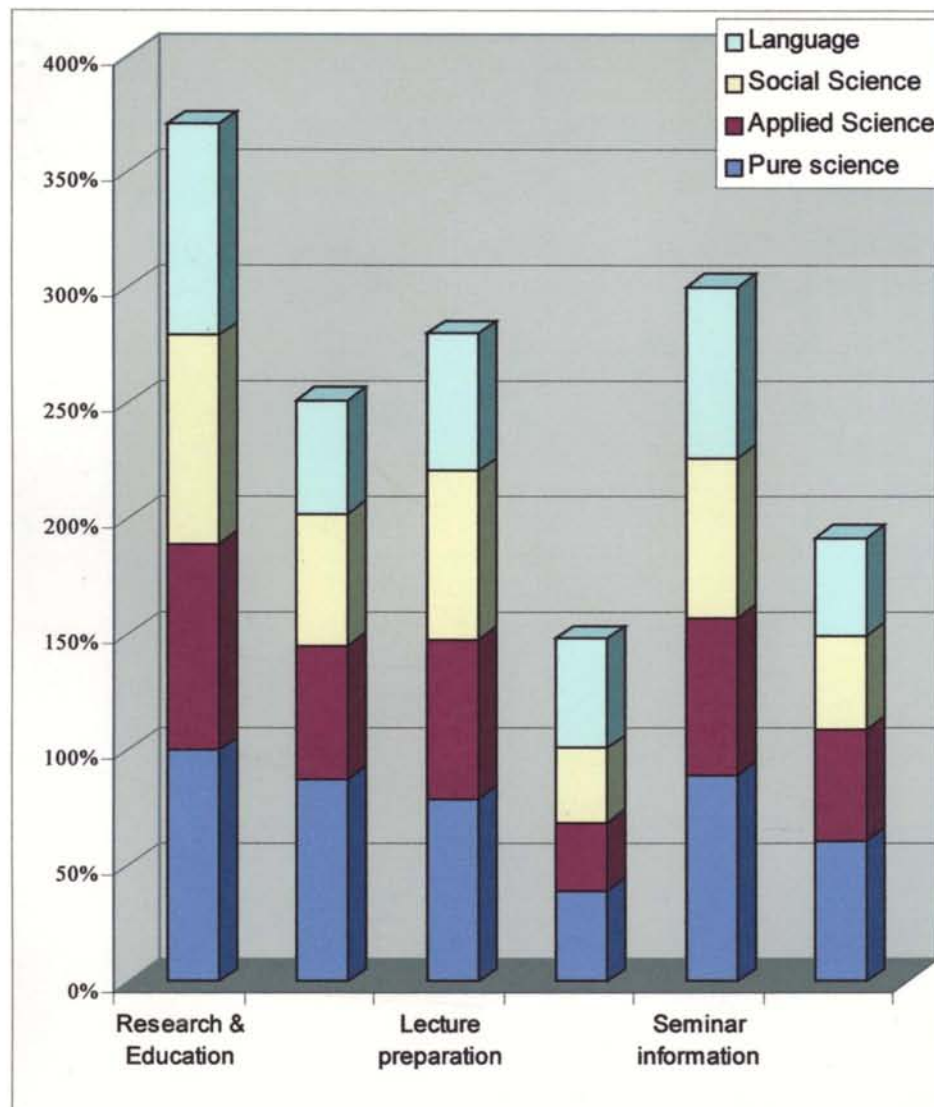
The major information seeking activities through internet include: Research & education, publication information, lecture preparation, job information, seminar information and library information services. Table 5.33 indicate how far these services are used by the faculty members of various universities. It depicts that an overwhelming majority (92.1%) use it if for information on research and education. Seminar information and Lecture preparation information are sought through the internet by 74% and 70.4% of the faculty members of various disciplines across the various disciplines. Least information activities are reported with respect to job information and library services with 35.3% and 48% respectively. May the complacent of the faculty members with the present salary and job security that resulted the low percent in this regard.

Information on Research and education is the most sought after material by most of the faculties of all the four disciplines. More than 89 % of the faculty members of all disciplines used it for the same. A higher number of faculties (88.9%) of Pure Science discipline used it for seeking information on seminar preparation. Those from language discipline followed it with 73.7%.

Among those who sought information on publication again the Pure Science discipline outnumbered others with 87.5%. In all the other disciplines, the percentage with respect to this was below 60%. Lecture information too is sought by a higher number of faculties from Pure Science discipline with 79.2% followed by Social Science and Applied Science with 72.8% and 68.9% respectively.

Job information on the other hand is sought by a comparatively higher number of faculty members from the Language discipline with 47.4%, seconded with those from Pure Science with 38.6%. The number of those who sought information of library services was higher in the Pure Science discipline when compared to the other disciplines.

**Fig. 5.8 Information seeking activities in internet**



## Communications activities

**Table 5. 34 : Communication activities in the internet**

N-331

Discipline	Subject expert	Overseas friends	Overseas educational institutions	Students	Local friends	Academic supervisor
	<b>Yes</b>					
<b>Pure Science</b>	59	58	55	33	40	38
	81.9%	80.6%	76.4%	45.8%	55.6%	52.8%
<b>Applied Science</b>	73	84	73	50	63	41
	60.3%	69.4%	60.3%	41.3%	52.1%	33.9%
<b>Social Science</b>	43	50	49	23	26	25
	53.1%	61.7%	60.5%	28.4%	32. %1	30.9%
<b>Language</b>	22	21	22	9	17	13
	38.6%	36.8%	38.6%	15.8%	29.8%	22. %8
<b>Total</b>	197	213	199	115	146	117
	59.5%	64.4%	60.1%	34.7%	44.1%	35.3%

Table 5.34 portrays the different purposes for which the internet facilities are used by the faculty members of various Universities in Kerala. Most (64.4%) considered and utilized internet for communicating with overseas friends. Communication with overseas educational institutions for academic purposes came second with 60.1%. Probably, the eagerness of the faculty members to obtain a certificate and scholarship for their further studies or researches might be the reason an increased percentage in this. Yet another major purpose for which the internet is

used by most (59.5%) is for communicating with the subject expert. Often the subject experts of various disciplines are on the move for academic purposes and on the move for certain other purposes, obstructing a person to person to contact for many of the other faculties. It is the internet facility that often comes as boon in these situations. Other purposes for which internet facilities are used with respect to communication included communicating with the academic supervisor, local friends and students with 35.3%, 44.1% and 34.7% respectively.

The table further explains how the different disciplines vary in their communication purposes. On the whole it is found that across all the disciplines communicating with overseas friends, overseas educational institutions and subject experts assumed much significance than all the others. Communication with the subject expert received prominence by 81.9% of the faculty members of the Pure Science category, Communication with the overseas friends followed it with 80.6%. Least use with respect to internet by the Pure Science category is reported for communicating with friends.

Among the Applied and Social Science faculty members internet is used by majority ( more than sixty percent each) for communicating with overseas friends and overseas institutions. Overall it is found that less number of faculty members from the Language discipline used the internet services for various communication purposes.

With respect to the mode of browsing the required information from the internet, the table no. shows that majority of the faculty members across the disciplines depended on search engines. The second most used method for browsing the information is typing the web address directly. Browsing through typing the web address is considered the easiest, if they knew the web addresses. Although, a vast collection of information is accessed through search engines, the filtering of information from this is a herculean task. The number of faculty members who used subscription of databases and subject ways for getting required information is found to be comparatively lower across all the disciplines. This may be due to the fact that through subject gateways only a finite area of subject is accessed.

**Frequency of using internet services Table 5. 35**

**Frequency of using internet services**

<b>E-MAIL</b>							
<b>Discipline</b>	<b>Irregular</b>	<b>More than once a day</b>	<b>Once a day</b>	<b>2-5 times a week</b>	<b>Once a week</b>	<b>2-5 times a month</b>	<b>Total</b>
<b>Pure Science</b>	24	45	2		1		72
	33.30%	62.50%	2.80%		1.40%		100.00%
<b>Applied Science</b>	55	43	18	1	4		121
	45.50%	35.50%	14.90%	0.80%	3.30%		100.00%
<b>Social Science</b>	59	15	6		1		81
	72.80%	18.50%	7.40%		1.20%		100.00%
<b>Language</b>	46	6	4			1	57
	80.70%	10.50%	7.00%			1.80%	100.00%
<b>Total</b>	184	109	30	1	6	1	331
	55.60%	32.90%	9.10%	0.30%	1.80%	0.30%	100.00%
<b>WWW</b>							
<b>Pure Science</b>	40	15	8	4	5		72
	55.60%	20.80%	11.10%	5.60%	6.90%		100.00%
<b>Applied Science</b>	60	39	7	7	6	2	121
	49.60%	32.20%	5.80%	5.80%	5.00%	1.70%	100.00%
<b>Social Science</b>	56	13	7	2	2	1	81
	69.10%	16.00%	8.60%	2.50%	2.50%	1.20%	100.00%
<b>Language</b>	43	7	6	1			57
	75.40%	12.30%	10.50%	1.80%			100.00%
<b>Total</b>	199	74	28	14	13	3	331
	60.10%	22.40%	8.50%	4.20%	3.90%	0.90%	100.00%
<b>NEWSGROUPS</b>							
<b>Pure Science</b>	44	11	6	6	5		72
	61.10%	15.30%	8.30%	8.30%	6.90%		100.00%
<b>Applied Science</b>	71	21	11	4	12	2	121
	58.70%	17.40%	9.10%	3.30%	9.90%	1.70%	100.00%

<b>Social Science</b>	42	21	11	2	3	2	81
	51.90%	25.90%	13.60%	2.50%	3.70%	2.40%	100.00%
<b>Language</b>	38	7	5	2	4	1	57
	66.70%	12.30%	8.80%	3.50%	7.00%	1.80%	100.00%
<b>Total</b>	195	60	33	14	24	5	331
	58.90%	18.10%	10.00%	4.20%	7.30%	1.50%	100.00%
<b>DOWNLOADING</b>							
<b>Pure Science</b>	62	1	1	3	4	1	72
	86.10%	1.40%	1.40%	4.20%	5.60%	1.40%	100.00%
<b>Applied Science</b>	82	7	4	4	20	4	121
	67.80%	5.80%	3.30%	3.30%	16.50%	3.30%	100.00%
<b>Social Science</b>	60	8	2	3	6	2	81
	74.10%	9.90%	2.50%	3.70%	7.40%	2.50%	100.00%
<b>Language</b>	38	12	3	1	2	1	57
	66.70%	21.10%	5.30%	1.80%	3.50%	1.80%	100.00%
<b>Total</b>	242	28	10	11	32	8	331
	73.10%	8.50%	3.00%	3.30%	9.70%	2.40%	100.00%
<b>RECREATION</b>							
<b>Pure Science</b>	60	3	5	1	3		72
	83.30%	4.20%	6.90%	1.40%	4.20%		100.00%
<b>Applied Science</b>	105	3	4	5	1	3	121
	86.80%	2.50%	3.30%	4.10%	0.80%	2.50%	100.00%
<b>Social Science</b>	61	9	1	1	7	2	81
	75.30%	11.10%	1.20%	1.20%	8.60%	2.40%	100.00%
<b>Language</b>	49	2	1	1	1	3	57
	86.00%	3.50%	1.80%	1.80%	1.80%	5.30%	100.00%
<b>Total</b>	275	17	11	8	12	8	331
	83.10%	5.10%	3.30%	2.40%	3.60%	2.40%	100.00%



Table on the frequency of various facilities on internet show that most of the faculty members were irregular users of the internet facilities like E-mail, www, news groups, downloads and recreation. Of this those who used irregularly for recreation are found to be at the top with 83.1% followed by the download information with 73.1%.

Those who used it more than once a day form the second highest group that utilized the various services of the internet. Those who utilized the aforementioned facilities once a day, 2-5 times a week, once a week and 2-5 times a month are found to be lesser in number. It is seen that irregular users or those who used according to the need figured prominently in all the facilities of the internet.

The distribution according to the discipline too is almost in the similar trend in all categories with respect to various services. Irregularity in the use of E-mail, WWW, and News groups is reported at the highest by the discipline of Language, with 80.7%, 75.4% and 66.7% respectively. Concerning recreation, it is the Applied science group that topped with 86.8%.

Lowest irregular users in each of the above services is reported as E-mail – pure science with 33.3%, WWW- Applied science with 49.6%, News groups – social science with 51.9% and recreation by social science with 75.3%. The frequent users ( more than once a day ) are found to be highest in the pure science category with 62.5% with regard to E-mail, applied science with respect to WWW with 32.2% and Social science with respect to Newsgroups and recreation with 25.9% and 11.1% respectively.

Overall, it is found that irregular users are a great majority, although some services like e-mail are used much more frequently than all the other services.

**Table 5.36 Discipline Vs the Internet services**

**Discipline Vs the Internet services**

<b>Internet Service</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>E-mail</b>	<b>Between Groups</b>	14.526	3	4.842	7.119	.000
	<b>Within Groups</b>	222.417	327	.680		
	<b>Total</b>	236.943	330			
<b>WWW</b>	<b>Between Groups</b>	13.565	3	4.522	3.616	.014
	<b>Within Groups</b>	408.864	327	1.250		
	<b>Total</b>	422.429	330			
<b>Newsgroups</b>	<b>Between Groups</b>	491.639	3	163.880	.988	.399
	<b>Within Groups</b>	54255.714	327	165.920		
	<b>Total</b>	54747.353	330			
<b>Downloading</b>	<b>Between Groups</b>	18.735	3	6.245	3.035	.029
	<b>Within Groups</b>	672.951	327	2.058		
	<b>Total</b>	691.686	330			
<b>Recreation</b>	<b>Between Groups</b>	4.362	3	1.454	1.030	.380
	<b>Within Groups</b>	461.837	327	1.412		
	<b>Total</b>	466.199	330			

The ANOVA test between category and the various services of the internet show that the use of E-mail, WWW and Downloading varies according to the category/disciplines. The calculated F value of E-mail, WWW and Downloading i.e., 7.114, 3.616 and 3.035 are found to be significant at the significant value of 0.000, 0.014 and 0.029 respectively. Both these significant values are less than the assumed significant value of 0.05. With respect to the other services the use does not vary in accordance to the difference in the categories.

## Use of internet information

**Table 5.37 Use of Internet information**

	<b>Research</b>	<b>Publication</b>	<b>Teaching</b>	<b>Guiding Research</b>	<b>Personal interest</b>
<b>Discipline</b>	<b>Yes</b>				
<b>Pure Science</b>	69	57	62	58	55
	95.8	79.2	86.1	80.6	76.4
<b>Applied Science</b>	103	63	109	81	91
	85.1	52.1	90.1	66.9	75.2
<b>Social Science</b>	67	42	70	48	57
	82.7	51.9	86.4	59.3	70.4
<b>Language</b>	47	19	45	31	37
	82.5	33.3	78.9	54.4	64.9
<b>Total</b>	286	181	286	218	240
	86.4	54.7	86.4	65.9	72.5

Table 5.37 highlights the purpose for which the information received through internet is used. It is seen from the table that research and teaching are the two main purposes for which the information from internet is used. 86.4% each of the respondents across the disciplines stated that they used it for research and teaching.

Personal interest is the second purpose for which internet is used which is reported to be 72.5% . The purpose of internet information as research guidance and publication are mentioned by 65.9% and 54.7% of the respondents respectively.

Discipline wise distribution as seen in the table portrays that more than 80% of the respondents from the Pure Science, Applied science, Social Science and Language disciplines stated that they used the information from the internet for research purposes. Highest in this regard is reported from the Pure Science with 95.8% followed by Applied science with 85.1%. Least is reported from the Language discipline with 82.5%.

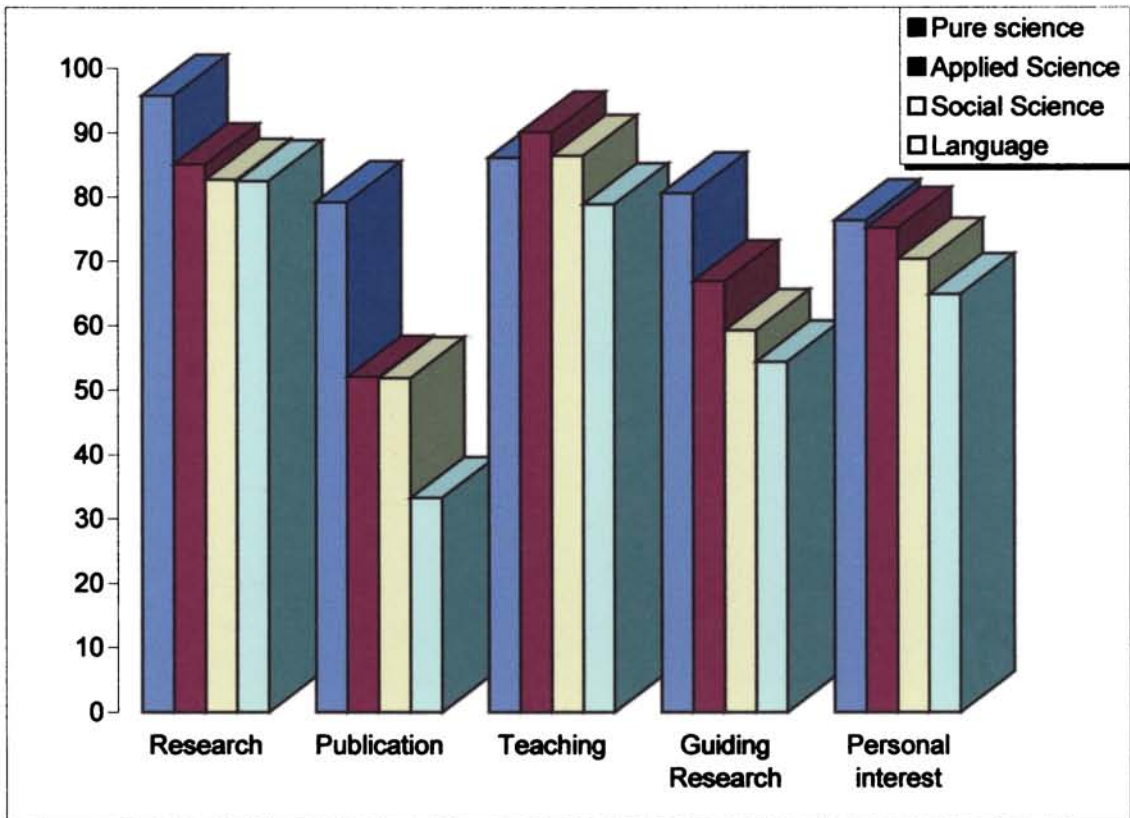
Teaching too is reported by a higher number of faculty members ( more than 75%) from all the four disciplines. Highest in this regard is recorded by the Applied Science group with 90.1% seconded by Social Science discipline with 86.4%. Here again it is the Language discipline that stood at the last with 78.9%.

Concerning personal interest and guiding research too it is the Pure Science category that stood comparatively higher than all the other three disciplines with 80.6% and 76.4% respectively. Lowest again is recorded by the Language discipline with 54.4% for research guidance and 64.9% for personal interest.

With respect to the publication too similar trend is noticed. Nevertheless, here the peculiarity is that a marked difference is noticed between the high and low percentages. While 79.2% from Pure Science reported the using of internet information for publication only 33.3% from Language discipline affirmed the same.

On the whole, it is found that internet information is used primarily for research and teaching purposes and for other purposes the internet is used comparatively at a lower rate. Moreover, it is found that the Language discipline lagged behind in using the internet information for various purposes.

**Fig. 5.9 Use of Internet information**



**Use of internet search engines**

**Table 5.38 Use of Internet Search Engines**

<b>GOOGLE</b>				
<b>Category</b>	<b>Never used</b>	<b>Sometimes</b>	<b>Often</b>	<b>Total</b>
<b>Pure Science</b>	14	3	55	72
	19.40%	4.20%	76.40%	100.00%
<b>Applied Science</b>	14	5	102	121
	11.60%	4.10%	84.30%	100.00%
<b>Social Science</b>	14	12	55	81
	17.30%	14.80%	67.90%	100.00%
<b>Language</b>	15	8	34	57
	26.30%	14.00%	59.60%	100.00%
<b>Total</b>	57	28	246	331
	17.20%	8.50%	74.30%	100.00%
<b>YAHOO</b>				
<b>Pure Science</b>	19	16	37	72
	26.40%	22.20%	51.40%	100.00%
<b>Applied Science</b>	25	20	76	121
	20.70%	16.50%	62.80%	100.00%
<b>Social Science</b>	17	19	45	81
	21.00%	23.50%	55.60%	100.00%
<b>Language</b>	21	15	21	57
	36.80%	26.30%	36.80%	100.00%
<b>Total</b>	82	70	179	331
	24.80%	21.10%	54.10%	100.00%

**ALTA VISTA**

<b>Pure Science</b>	53	10	9	72
	73.60%	13.90%	12.50%	100.00%
<b>Applied Science</b>	94	19	8	121
	77.70%	15.70%	6.60%	100.00%
<b>Social Science</b>	70	10	1	81
	86.40%	12.30%	1.20%	100.00%
<b>Language</b>	50	5	2	57
	87.70%	8.80%	3.50%	100.00%
<b>Total</b>	267	44	20	331
	80.70%	13.30%	6.00%	100.00%
<b>LYCOS</b>				
	59	12	1	72
<b>Pure Science</b>	81.90%	16.70%	1.40%	100.00%
	108	10	3	121
<b>Applied Science</b>	89.30%	8.30%	2.50%	100.00%
	79	2		81
<b>Social Science</b>	97.50%	2.50%		100.00%
	55	2		57
<b>Language</b>	96.50%	3.50%		100.00%
	301	26	4	331
<b>Total</b>	90.90%	7.90%	1.20%	100.00%
<b>EXCITE</b>				
<b>Pure Science</b>	65	7		72
	90.30%	9.70%		100.00%
<b>Applied Science</b>	118	2	1	121
	97.50%	1.70%	0.80%	100.00%
<b>Social Science</b>	80		1	81
	98.80%		1.20%	100.00%
	100.00%			100.00%

<b>Total</b>	320	9	2	331
	96.70%	2.70%	0.60%	100.00%
<b>WEB CRAWLER</b>				
<b>Pure Science</b>	64	8		72
	88.90%	11.10%		100.00%
<b>Applied Science</b>	117	2	2	121
	96.70%	1.70%	1.70%	100.00%
<b>Social Science</b>	79		2	81
	97.50%		2.50%	100.00%
<b>Language</b>	55	2		57
	96.50%	3.50%		100.00%
<b>Total</b>	315	12	4	331
	95.20%	3.60%	1.20%	100.00%
<b>MAGALLEN</b>				
<b>Pure Science</b>	64	8		72
	88.90%	11.10%		100.00%
<b>Applied Science</b>	117	2	2	121
	96.70%	1.70%	1.70%	100.00%
<b>Social Science</b>	79		2	81
	97.50%		2.50%	100.00%
<b>Language</b>	55	2		57
	96.50%	3.50%		100.00%
<b>Total</b>	315	12	4	331
	95.20%	3.60%	1.20%	100.00%

Table on the frequency of the use of various search engines indicate that 70% of the faculty members across the various disciplines responded that they never used the search engines such as, Alta vista, Lycos, Excite, Web crawler and Magellan . It is seen from the table that more than 70% responded in this line. On the other hand it is noted that the number of faculty who never used Yahoo and Google are comparatively low. In these two search engines most of the respondents have used them oftener than the other search engines. Probably,



it is the lack of knowledge regarding the former search engines that resulted in the low utilization rate in those search engines.

Discipline wise distribution too showed a similar trend wherein the faculty members of all the four disciplines used mostly 'Google' and Yahoo and that too oftener.

The users of the other search engines in all the disciplines are comparatively low.

**Table 5.39 Ranking of Internet Search Engines**

<b>Search Engines</b>	<b>Pure Science</b>		<b>Applied Science</b>		<b>Social Science</b>		<b>Language</b>		<b>Total</b>	
<b>Google</b>	.6111	3	.5950	2	.6543	2	.3158	2	.5650	2
<b>Yahoo</b>	1.1667	1	.9504	1	.9506	1	.4035	1	.9033	1
<b>Alta Vista</b>	.8333	2	.4380	3	.4691	3	.1579	3	.4834	3
<b>Lycos</b>	.4861	4	.1583	4	.2346	5	.0702	6	.2333	4
<b>Excite</b>	.3971	5	.0826	8	.1646	6	.0000	4	.1558	7
<b>Web Crawler</b>	.3478	8	.1525	5	.1447	7	.0755	7	.1804	6
<b>Magellan</b>	.3611	6	.1356	6	.2436	4	.0566	5	.1994	5

The preferences by the faculty members for the various search engines show that yahoo is ranked or most preferred engine by most of the faculty members. It topped with first rank with a mean of .9033. Google is the second engine that is preferred with a mean score of .56. Third and fourth preferred engines are Alta vista and Lycos with a mean score of .48 and .233. The lowest ranked search engines( 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> ) are Magellan , Web crawler and Excite.

Discipline wise distribution of the preferences too did not show much variation as seen in the table. The first preference by all the discipline is given to Yahoo. Probably the wide publicity and easy accessibility might have contributed to this phenomenon.

The second rank of preference is Google, preferred for all disciplines except Pure Science discipline for which Alta vista was the second choice. The others received only lower ranks with slight variations in the rank places.

### Mode of Browsing Internet

**Table 5.40 Mode of browsing internet**

The table depicts in detail the variations in the mode of browsing across the various disciplines.

	Type the web address directly	Use search engines	Use subscriptio n databases	Subject Gateways	N
<b>Pure Science</b>	44	51	9	20	72
	61.1%	70.8%	12.5%	27.8	21.75
<b>Applied Science</b>	60	100	6	8	121
	49.6	82.6	4.9	6.6	36.5
<b>Social Science</b>	44	56	4	5	81
	54.3	69.1	4.9	6.2	24.5
<b>Language</b>	25	40	5	3	57
	43.8	70.2	8.8	5.3	17.2

The table 5.40 shows a similar trend in all the disciplines. Use of Search Engines is found to be the most commonly used mode of browsing information from the internet by all the disciplines under study. Highest in this regard is reported from the Applied Science with 82.6% followed by Pure Science and Language discipline with 70.8% and 70.2% respectively. The lowest in this regard is reported from Social Science discipline with 69.1%. The second mode across all the disciplines too is found to be by typing the web address directly. Pure science followed by Social Science discipline figured prominently in this regard with 61.1% and 54.3% each. Language discipline recorded the lowest in this respect with 43.8%.

With regard to the use of subject ways for browsing information, Pure science group figured prominently with 27.8%. In all the other disciplines the number in this regard was lesser than 10%.

## Section E

### Internet and Teaching

**Table 5. 41 : The Impact of internet on teaching according to discipline**

Discipline	Impact of internet on teaching				Total
	No response	Average impact/influence	Good impact/influence	Very good impact/influence	
Pure Science	4 5.6%	18 25.0%	21 29.2%	29 40.3%	72 100.0%
Applied Science	4 3.3%	21 17.4%	59 48.8%	37 30.6%	121 100.0%
Social Science	6 7.4%	13 16.0%	45 55.6%	17 21.0%	81 100.0%
Language	5 8.8%	19 33.3%	25 43.9%	8 14.0%	57 100.0%
<b>Total</b>	19 5.7%	71 21.5%	150 45.3%	91 27.5%	331 100.0%

Table on the perception of the faculty members on the impact of internet on teaching highlights that according to most (45.3%) of the faculty members use of internet has an extensive (good) impact/influence on the teaching. Very good impact/influence is reported by 27.5% of the faculty members. Average level of impact/influence is stated by 21.5% of the faculty members across the various disciplines. On the whole it is explicit from the responses of the faculty members that an overwhelming majority of the faculty members reported a positive influence/ impact on their teaching level. The up to date information gained, and the vast dimensions of the same topic acquired from various parts of the world make the subject of teaching more enriched. The table also exhibits a minor percent of faculty members who did not respond to this query. Probably,

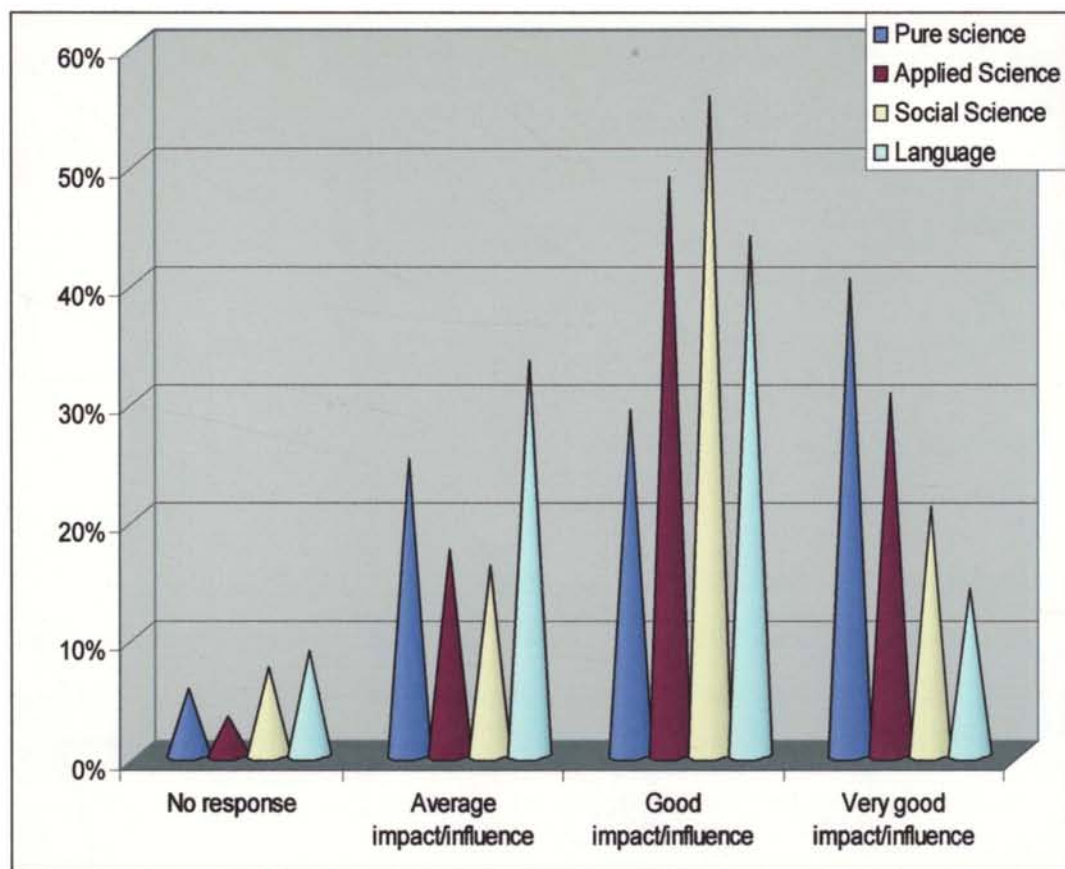
absence of use of internet for teaching purposes or unable to measure the application of the same in teaching might be the reason for the same.

It is seen from the above table again that among those who stated very good impact/influence of the internet in teaching, Pure science and Applied Science categories figured prominently with 40.3% and 30.6% respectively. Similarly, good impact/influence is reported to be at the highest in the Social Science discipline with 55.6% followed by Applied science with 48.8% each.

The table further spells out that among those who did not respond to the query, the Language discipline topped with 7.4% closely followed by Social Science discipline with 7.4%.

The study points out the positive impact/influence of the internet on the teaching of the faculty members of all the universities in Kerala. Indeed it is an indicator to the universities to equip each department with suitable number of computer systems with internet facilities facilitating a better input on the subject taught.

**Fig. 5.10 The Impact of internet on teaching according to discipline**



**Contribution of internet to information and Communication needs**

**Table 5. 42 : Contribution of internet to information and Communication needs according to Discipline**

Discipline	Contribution to Information			contribution to Communication		
	Immeasurable	A great amount	A fair amount	Immeasurable	A great amount	A fair amount
<b>Pure Science</b>	33 45.8%	31 43.1%	8 11.1%	28 38.9%	33 45.8%	11 15.3%
<b>Applied Science</b>	52 43.0%	48 39.7%	21 17.4%	39 32.2%	66 54.5%	16 13.2%
<b>Social Science</b>	32 39.5%	39 48.1%	10 12.3%	31 38.3%	40 49.4%	10 12.3%
<b>Language</b>	25 43.9%	25 43.9%	7 12.3%	21 36.8%	24 42.1%	12 21.1%
<b>Total</b>	142 42.9%	143 43.2%	46 13.9%	119 36.0%	163 49.2%	49 14.8%

Table 5.42 displaying the figures on the contribution of internet in information and communication needs indicate that almost an equal percent of faculty members across the various discipline stated the contribution to information as immeasurable and a great amount with 42.9% and 43.2% respectively. Similarly, with respect to the contribution to communication needs too those who stated it as immeasurable and a great amount figured prominently with 36% and 49.2% respectively. The figures show that the faculty members on the whole are aware of the contribution that internet provide towards information and communication requirement. It is to be noted here that none had reported on the negative i.e., denying the contribution rather they differ only in their perception on the extent of contribution.

The disparity of opinion regarding the same across the various discipline highlight that comparatively a higher number of faculty members from the Applied Science category (17.4%) reported a fair amount of contribution than 'immeasurable' and 'a great amount'. On the other hand with respect to the contribution to communication needs the number of faculty members from the Language discipline figured prominently among those who mentioned 'a fair amount of contribution.'

Among those who reported immeasurable contribution towards information needs, the members from Pure Science category and Applied Science category topped the others with 45.% and 43% respectively. Whereas in the case of those who stated the contribution as a great amount, Social Science group ranked first with 48.1% followed by Pure Science with 43.1%.

As regards the contribution towards communication needs, it was again the faculty members from the Pure Science category who outnumbered the others in stating the contribution as immeasurable with 38./9% seconded with Social Science group with 38.3%. Similarly, among those who reported the contribution as a great amount Applied science overstepped others with 54.5% followed by 49.4%.

It is thus clear that none had a disagreement regarding the contribution internet renders towards communication and information needs. But their perception on the contribution differs in their degree of contribution as the opinion is relative depending on their use and awareness.



## Adequacy of information needs

**Table 5. 43 The adequacy of information needs through internet according to disciplines**

Discipline	Adequacy of information needs			Total
	Always	Sometimes	Never	
Pure Science	9	55	8	72
	12.5%	76.4%	11.1%	100.0%
Applied Science	19	97	5	121
	15.7%	80.2%	4.1%	100.0%
Social Science	9	69	3	81
	11.1%	85.2%	3.7%	100.0%
Language	4	46	7	57
	7.0%	80.7%	12.3%	100.0%
Total	41	267	23	331
	12.4%	80.7%	6.9%	100.0%

The table above exhibits if the information received from internet on various topics relevant to the faculty members is adequate to meet their requirements. Accordingly, only a minor percentage of 12.4% reported that it satisfied their requirement as always. Yet another minor percent of 6.9% faculty members from the various universities stated that it never fulfilled their requirement. Majority, (80.7%) on the other held the view that it gratified their requirement sometimes.

Among those who reported that the information through internet satisfied their requirements 'always' the faculty members from Applied Science group outnumbered others with 15.7%. Pure Science discipline followed it with 12.5%. Further, the table depicts that among those who stated Never, the Language discipline had the highest representation with 12.3% seconded by Pure Science discipline with 11.1%.

## Reliance on internet services

**Table 5.44 The extent of reliance on internet services according to disciplines**

Discipline	Extent of reliance on internet services					Total
	100%	75-99%	50-74%	25-49%	<25%	
Pure Science	5	24	22	10	11	72
	6.9%	33.3%	30.6%	13.9%	15.3%	100.0%
Applied Science	1	39	42	20	19	121
	.8%	32.2%	34.7%	16.5%	15.7%	100.0%
Social Science	3	12	37	13	16	81
	3.7%	14.8%	45.7%	16.0%	19.8%	100.0%
Language		15	10	12	20	57
		26.3%	17.5%	21.1%	35.1%	100.0%
Total	9	90	111	55	66	331
	2.7%	27.2%	33.5%	16.6%	19.9%	100.0%

The extent of reliance on internet for various purposes by the faculty members of various disciplines are portrayed in the table above. It shows that almost 30% of the faculty members reported that they depended on internet for more than 75% of their purposes. Of this, 2.7% stated their dependence at cent percent. Those who depended 50-75% were higher with 33.5%. The others i.e., 36.5% reported their dependence at lower than 50% with a distribution of 16.6% and 19.9% reporting 25-49% and less than 25% reliance respectively.

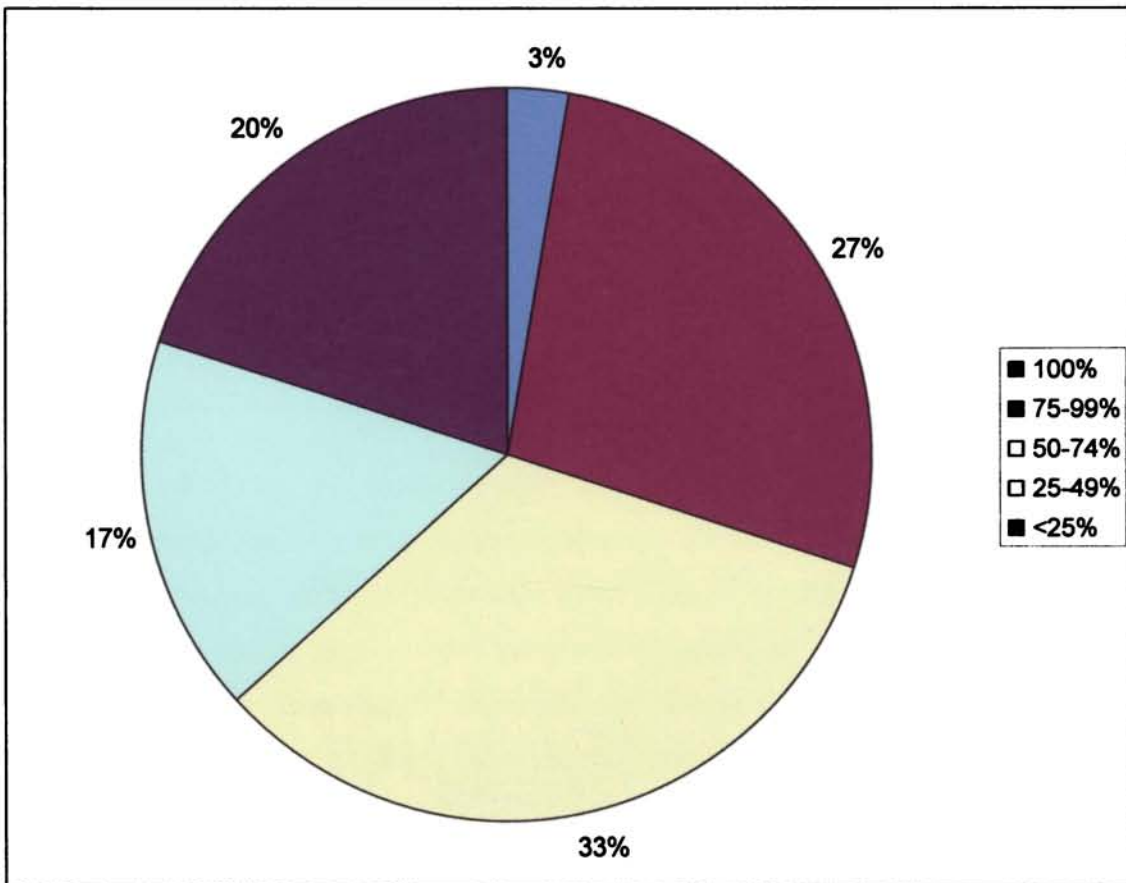
The variations across the various disciplines with respect to the dependence reveal that a higher number of faculty members from Pure Science (40.2%) and Applied Science (33%) do rely on internet at more 75%. Lowest in

this respect is reported from the discipline of language. Within those who stated cent percent dependence again the pure science discipline had the highest representation with 6.9%.

Among those who reported 50-75% reliance on the internet for various purposes Social science category topped with 45.7% followed by Applied science discipline with 34.7%. Those who reported lesser degree of dependence is found to be at the maximum in the discipline Language with 56.2%.

The ANOVA test between the dependence and the disciplines showed that the dependence on internet varied according to the disciplines. The Calculated F value of 4.420 is found to be significant at 0.05. Similarly, the test conducted between the dependence and gender too highlighted that the reliance varied according to the gender i.e., male and female. The calculated significance value of 0.001 is less than 0.05 showing the variation of the reliance between the two gender categories.

**Fig. 5.11 The extent of reliance on internet services according to disciplines**



## Desirability of Internet services

**Table 5.45 : Desirability of Internet bibliographical databases according to discipline**

Discipline	Desirability of Internet Bibliographic databases			Total
	Desirable	Required	Not required	
Pure Science	26	42	4	72
	36.1%	58.3%	5.6%	100.0%
Applied Science	47	60	14	121
	38.8%	49.6%	11.6%	100.0%
Social Science	35	36	10	81
	43.2%	44.4%	12.3%	100.0%
Language	25	23	9	57
	43.9%	40.4%	15.8%	100.0%
Total	133	161	37	331
	40.2%	48.6%	11.2%	100.0%

The study also had made a probe into the desirability of the faculty members towards bibliographic databases through internet. The table above picturing the findings of the probe shows that 11.2% of the faculty members stated that they do not require the bibliographical databases through internet facility. Among the others 40.2% expressed their desire for the same in the Internet. The remaining i.e., 48.6% stated that they require the same through the internet.

Discipline wise desirability shows that more than 40% across all the disciplines report that they require bibliographic databases through internet. Highest in this regard is reported from the Pure Science discipline with 58.3%. Among those who desired this service the Language discipline outnumbered

others with 43.9% closely followed by Social Science discipline with 43.2%. Moreover, among those who reported non-requirement of the bibliographical databases in the internet language discipline reported the highest with 15.8%.

**Table 5.46 Gender wise distribution of the desirability of Internet Bibliographic databases**

Gender	Desirability of Internet Bibliographic databases			Total
	Desirable	Required	Not required	
Male	76	79	18	173
	43.9%	45.7%	10.4%	100.0%
Female	57	82	19	158
	36.1%	51.9%	12.0%	100.0%
Total	133	161	37	331
	40.2%	48.6%	11.2%	100.0%

Desirability according to gender indicate that the males outnumbered females. While 43.9% of the males reported of the desirability of internet bibliographic databases, the corresponding figure for females is only 36.1%.

Of those who mentioned the non requirement of internet bibliographic databases the females had a slightly upper representation by a margin of 1.6%.

A cross analysis between the desirability and years of service highlighted that those who had a higher number years of service desired the internet bibliographic databases. Those who stated the non-requirement of the same is seen among those below 30 yrs of experience. It is also seen that as the years of service increased the number of faculty members who mentioned non requirement were lesser.

**Table 5. 47 The Desirability of Internet Bibliographic databases  
according to years of service**

Years of service	Desirability of Internet Bibliographic databases			Total
	Desirable	Required	Not required	
1-10 yrs	61	78	24	163
	37.4%	47.9%	14.7%	100.0%
10-20 yrs	35	40	9	84
	41.7%	47.6%	10.7%	100.0%
20-30 yrs	27	42	4	73
	37.0%	57.5%	5.5%	100.0%
30-40 yrs	10	1		11
	90.9%	9.0%		100.0%
Total	133	161	37	331
	40.2%	48.6%	11.2%	100.0%

The t- test between the desirability and gender however reveal that the desirability do not vary according to the gender variation. The significance of the 't' value is found to be 0.315 which is greater than the assumed significance of 0.05. This emphasizes the non-variability of the desirability according to gender.

## Section F

### Availability of Internet Service in the University Library

**Table 5. 48 : Discipline wise opinion on availability of internet services in university libraries**

Discipline	Availability		Total
	Available	Not Available	
<b>Pure Science</b>	69	3	72
	95.8%	4.2%	100.0%
<b>Applied Science</b>	112	9	121
	92.6%	7.4%	100.0%
<b>Social Science</b>	69	12	81
	85.2%	14.8%	100.0%
<b>Language</b>	48	9	57
	84.2%	15.8%	100.0%
<b>Total</b>	298	33	331
	90.0%	10.0%	100.0%

The 5.48 showing the availability of internet services in the university libraries indicate that 90% of faculty members across the various disciplines affirmed the availability of the facility. Nevertheless, 10% disagreed in this regard.



The table further exhibits that the number of faculty members who responded on the negative i.e., on the non availability of the internet services in their libraries, the discipline of Language figured prominently with 15.8% closely followed by those from Social Science discipline with 14.8%. Lowest in this respect is reported from the Pure science discipline with 4.2%

The data as seen from the table show that universities still need to make efforts to make the availability of internet services at a frequent and easy accessible level to all the faculty members of various universities.

#### Availability of databases in the university library

**Table 5. 49 Discipline wise availability of Database in the University Library**

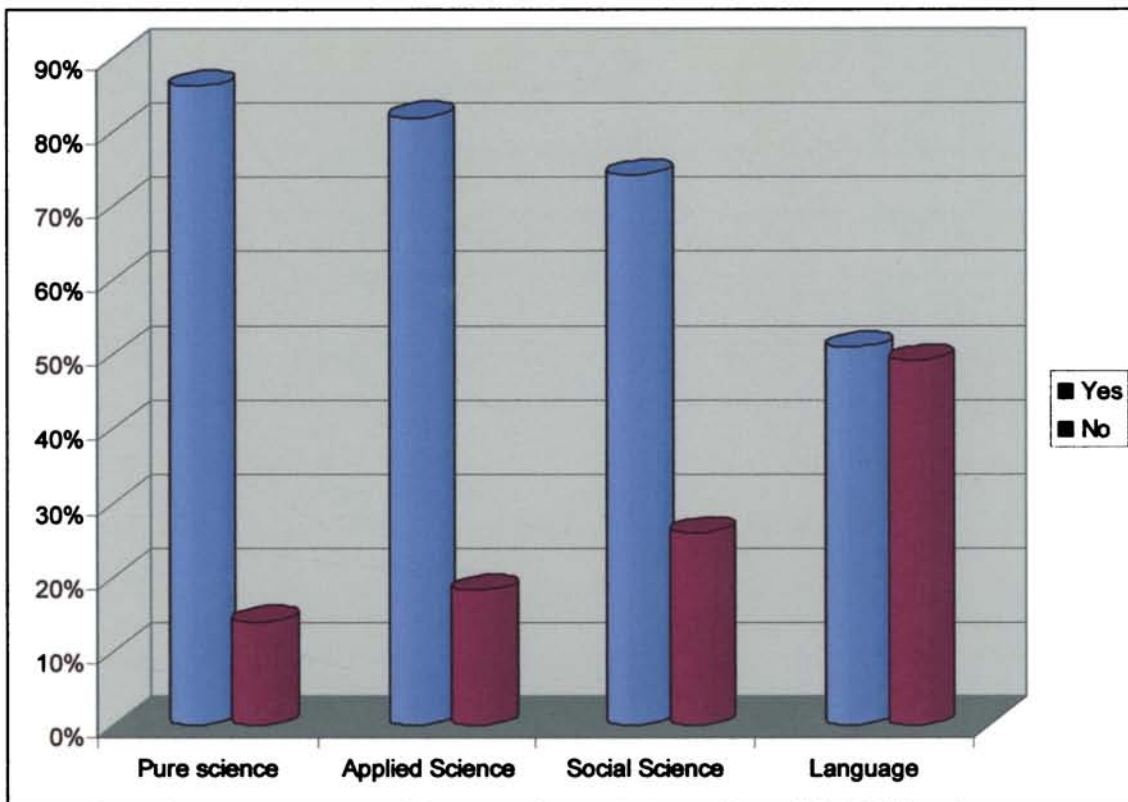
Discipline	Availability of Data base		Total
	Available	Not Available	
Pure Science	62	10	72
	86.1%	13.9%	100.0%
Applied Science	99	22	121
	81.8%	18.2%	100.0%
Social Science	60	21	81
	74.1%	25.9%	100.0%
Language	29	28	57
	50.9%	49.1%	100.0%
Total	250	81	331
	75.5%	24.5%	100.0%

Table 5.49 shows that 75.5% of university faculty members have access to databases in their respective university libraries. The rest, i.e., 24.5% of the faculty members reported the non availability of the same in their university libraries.

Most of the faculty members from the disciplines of Pure Science (86.1%) , Applied Science (81.1%) and Social Science (74.1%) reported the availability of data bases in their respective University libraries. Lowest number that reported the availability in this regard is seen in the Language discipline with 50.9%

The non use or low level of awareness could also result from the absence of the facilities for the same in the respective universities.

**Fig.5.12 Discipline wise availability of Database in the University Library**



## Awareness on the subject content of E-journals

**Table 5. 50 Discipline-wise awareness on the Subject content of E-journals**

Discipline	Awareness of E-Journal Contents			Total
	Not aware	Aware to an extent	Aware to a great extent	
Pure Science	5	38	29	72
	6.9%	52.8%	40.3%	100.0%
Applied Science	43	58	20	121
	35.5%	47.9%	16.5%	100.0%
Social Science	28	41	12	81
	34.6%	50.6%	14.8%	100.0%
Language	45	12		57
	78.9%	21.1%		100.0%
Total	121	149	61	331
	36.6%	45.0%	18.4%	100.0%

Table 5.50 depicts that 45% of the faculty members across the departments of the various universities in Kerala are aware of the subject content of the E-Journal 'to an extent'. However, it should be noted that a good number (36.6%) are not aware of the subject of the E-journals. The remaining, i.e., 18.4% are aware of the subject content of the e-journals subscribed in their university libraries to a great extent.

The table further exhibits that in all the disciplines except that of Language, most of them have a basic knowledge of the subject content of the E-journals. Faculty members from the Pure science discipline had the highest representation (52.8%) with those who have some awareness on the subject content of the E-journals. Lowest in this regard is reported from the Language discipline with 21.1%.

Among those who do not have awareness on the same is recorded at a higher percentage in the Language discipline with 78.9% followed by Applied Science with 35.5%. Minimum number of members who had no awareness regarding E-journal is from the Pure Science discipline with 6.9%. Those who are aware to a great extent is reported highest from the Pure science discipline with 40.3% followed by those from Applied science with 16.5%.

The data thus further reiterates that those from the discipline of Language have low awareness on Internet and the subject content of E-Journals as well. Probably better awareness in this regard to the faculty members of all universities.

**Table 5.51 Gender wise awareness of electronic databases in the university library**

Awareness	Gender		Total
	Male	Female	
Not aware	43	78	121
	35.5%	64.5%	100.0%
Aware of some of them	87	62	149
	58.4%	41.6%	100.0%
Aware of many of them	43	18	61
	70.5%	29.5%	100.0%
Total	173	158	331
	52.3%	47.7%	100.0%

Table 5.51 portrays gender wise distribution of the awareness on subject matter of E-journals. Accordingly, it shows that compared to females, more number of males have better awareness on the subject content of E-Journals. While 70.5% of males have awareness at a greater extent, the corresponding

figure for females is only 29.5%. Comparatively higher number (64.5%) of female faculty members do not have awareness on the subject matter of E-journals. It is explicit from the table that more awareness on Internet and related subjects should be imparted to faculty members especially the female faculty members.

**Table 5.52: ANOVA for awareness and discipline of faculty members regarding electronic databases**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	40.183	3	13.394	33.449	.000
<b>Within Groups</b>	130.941	327	.400		
<b>Total</b>	171.124	330			

The ANOVA test between the awareness and the category or disciplines show that the awareness level of the subject content of e-journals varies according to the disciplines. The F value through ANOVA test is 33.449 and the significance value is 0.000 which is less than 0.05 showing the significance.

## Use of electronic databases in the University Library

**Table 5. 53: Use of Electronic databases that the University Library provides in the library web pages**

Discipline	Use of Electronic Databases		Total
	Using	Not using	
Pure Science	49	23	72
	68.1%	31.9%	100.0%
Applied Science	59	62	121
	48.8%	51.2%	100.0%
Social Science	37	44	81
	45.7%	54.3%	100.0%
Language	7	50	57
	12.3%	87.7%	100.0%
Total	152	179	331
	45.9%	54.1%	100.0%

It is seen that only 45.9% of the faculty members of the various universities are using the electronic databases that the University library provides. It is however surprising that more than 50% of them were not using the above facility. The reason may be lack of time after the class hours or the inadequacy of computer systems that refrain the use of electronic databases of the university libraries.

The table further displays the level of use of the electronic data base by the faculty members of different universities. It is seen from the table that a higher number (68.1%) of the faculty members from the pure science category followed by those from Applied Science (48.8%) used the electronic databases of the university libraries. The least number of users in this regard is found to be from the discipline of the Language. In other words the non-users are found to be at the highest in the discipline of language.

Probably, the reason for the difference in the opinion in this regard might be that the faculty members of Pure Science, Applied Science and Social Science disciplines have a higher need of electronic data base than those of the Language discipline.

**Table 5. 54 ANOVA between use of electronic databases and discipline of faculty members**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	10.076	3	3.359	15.228	.000
<b>Within Groups</b>	72.123	327	.221		
<b>Total</b>	82.199	330			

The results of the ANOVA test between the discipline and the use too show that the use of the electronic data base of the university library differs according to the discipline/category. The calculated F value of 15.228 is found to be significant at 0.000 which is less than 0.05 depicting the variation in the use of electronic database according to the discipline.



## Importance given to electronic databases

**Table 5.55 Discipline wise opinion of faculty members regarding importance given to electronic data bases**

Importance given to various activities	Pure Science	Applied Science	Social Science	Language	Total
Research Activities	.6667 1	.4463 1	.4691 1	.1754 2	.4532 1
Lecture preparation	.4444 3	.3471 2	.3580 2	.1754 2	.3414 3
Publication	.2639 4	.3471 2	.2593 4	.2105 1	.2840 4
Full Text access	.5556 2	.3058 4	.3580 2	.1579 4	.3474 2
Information about electronic data base	.2639 4	.1653 5	.2222 5	.1228 5	.1934 5

The ranks are allotted according to the mean arrived at from the preferences the faculty members allotted. Accordingly it is seen from the table that internet was used predominantly for the research activities. Research activities received the first rank with the mean score of .45. Full text access through internet received the second rank with .3474 followed by lecture preparation at the third position with a mean score of .34. Publication and information about electronic data base with .28 and .19 as the mean scores have the fourth and fifth position.

It is explicit from the table and mean scores, that most of the faculty members preferred to use the electronic databases of the university library for the research activities.

Discipline wise analysis of the table portray that except the case of Language discipline in all the other disciplines research activities are given the first priority. But in the case of the Language discipline, first rank is given to publication. Probably, low rate of research carried out in the Language discipline that pushed research to the second position in this regard.

Lecture preparation received the second rank in all the categories except that of pure science. With regard to the Pure Science discipline second rank is received with respect to full text access.

Concerning publication as seen earlier first rank was given by the Language discipline with a mean score of .21. Applied science comes next and the other two Social Science and Pure Science are in 4<sup>th</sup> position to publication. As many of the faculty members are not keen on publication the rank given in the Pure Science and Social Science disciplines is found to be low in both these cases.

Full text access received 2<sup>nd</sup> rank by the faculty members of the pure science and social science disciplines. In the case of other disciplines viz., Applied science and language, the rank position given was 4<sup>th</sup>.

Information about electronic data base received the lowest rank irrespective of the disciplines.

**Table 5. 56 Discipline wise reasons for not using electronic data bases**

<b>Reasons</b>	<b>Pure Science</b>	<b>Applied Science</b>	<b>Social Science</b>	<b>Language</b>	<b>Total</b>
<b>Non awareness on the use of electronic data base</b>	.1944 3	.3058 2	.5802 1	.4561 2	.3746 1
<b>Lack of knowledge on Digital technology</b>	.1806 5	.2645 3	.4691 2	.2500 4	.2939 4
<b>Lack of interest</b>	.1944 3	.2645 3	.3580 3	.2982 3	.2779 5
<b>Opinion of not useful</b>	.3611 2	.3083 1	.3210 5	.2281 5	.3091 3
<b>Sought information from other sources</b>	.4167 1	.2583 5	.3500 4	.5789 1	.3708 2

The reasons for using the databases are collected under 5 heads viz., nonawareness on the electronic data base, lack of knowledge on digital technology, lack of interest, opinion of not useful and seeking information from other sources. The reasons were ranked according to their priority. The rank is allotted in line with the mean score calculated. Higher the mean higher the rank. Accordingly, the table above show that the prime or major reason for the non-use of the electronic databases is the non awareness on the use of electronic data base. It received the first rank with a mean score of .37. The second reason for the non-use was that majority of them sought information from other sources. Seeking information from other sources received the second rank with a mean score of .3708. Others opinion stating that it is not useful received the third rank with a mean score of .309 indicating that they instead of using the

electronic data bases at the university library used some other means. The least important reasons for not using the electronic data bases were lack of knowledge on digital technology and lack of interest with mean scores of .29 and .27 respectively.

Discipline wise analysis shows that among the Pure Science faculty members the prime reason for not using the electronic data bases is that they sought information from other sources which has a mean score of .4167. Second and third rank is received by the opinion of not useful and lack of interest and non awareness on the use of electronic data bases. Least important reason according to the faculty members of pure science is lack of knowledge on digital technology. It was given the lowest rank.

Within the Applied Science discipline, the most important reason for not using the electronic databases is the opinion of not useful as it secured the highest mean score of .3083. Non awareness is the second most reason for the non use of the electronic data base with a mean score of .305. Lack of interest and lack of knowledge on digital technology received the third rank with a mean score of .2645. The lowest score/rank is received by seeking information from other sources with a mean score of .25.

Within the Social Science discipline, the most important reason for the non use of the electronic data base is the non awareness on the electronic data base. Non awareness received the first rank with a mean score of .5802. Lack of knowledge on digital technology and lack of interest assumed the 2<sup>nd</sup> and 3<sup>rd</sup> rank with a mean score of .4691 and .3580 respectively. The lowest scores are received by seeking information from other sources and opinion of not useful with the mean scores of .350 and .321 and 4<sup>th</sup> and 5<sup>th</sup> ranks respectively.

With regard to the opinion of the faculty members of the language discipline seeking information from other sources was the first and foremost reason cited as it received the first rank with a mean score of .5789. The second important reason for not using the database was the non awareness with a mean score of .45. The other reasons viz., lack of interest, lack of knowledge on digital technology and opinion of not useful received the 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> preferences respectively with the mean scores of .2982, .2500 and .2281.

On the whole, it is found that non awareness on the use of electronic data base was the prime reason for the non use of electronic data base available in the university libraries of various universities. It is therefore warranted that serious steps be initiated by the universities for creating awareness on the same among the faculty members in order to make their teaching as well as to keep their academic ability on the rising knot.

#### Replacement of library services

**Table 5.57 Replacement of library services with Internet**

Discipline	Replacement		Total
	Not to be replaced	Replaced	
Pure Science	69	3	72
	95.8%	4.2%	100.0%
Applied Science	113	8	121
	93.4%	6.6%	100.0%
Social Science	79	2	81
	97.5%	2.5%	100.0%
Language	51	6	57
	89.5%	10.5%	100.0%
Total	312	19	331
	94.3%	5.7%	100.0%

Table 5.57 on Replacement of library services portrayed that most of the faculty members of various universities of Kerala stated that the internet facilities can not replace the library services. Only 5.7% have mentioned that the new information technology “INTERNET” will replace the library services.

It is further seen that among the different disciplines majority (97.5%) from social science discipline followed by pure science (95.8%) and applied science (93.4%) disciplines emphatic on saying that the internet can not be replaced with the respect to the transmission of information. Those who mentioned that the internet can be replaced are found to be highest in the discipline of language with 10.5%.

## Section G

### Satisfaction of the results of internet search

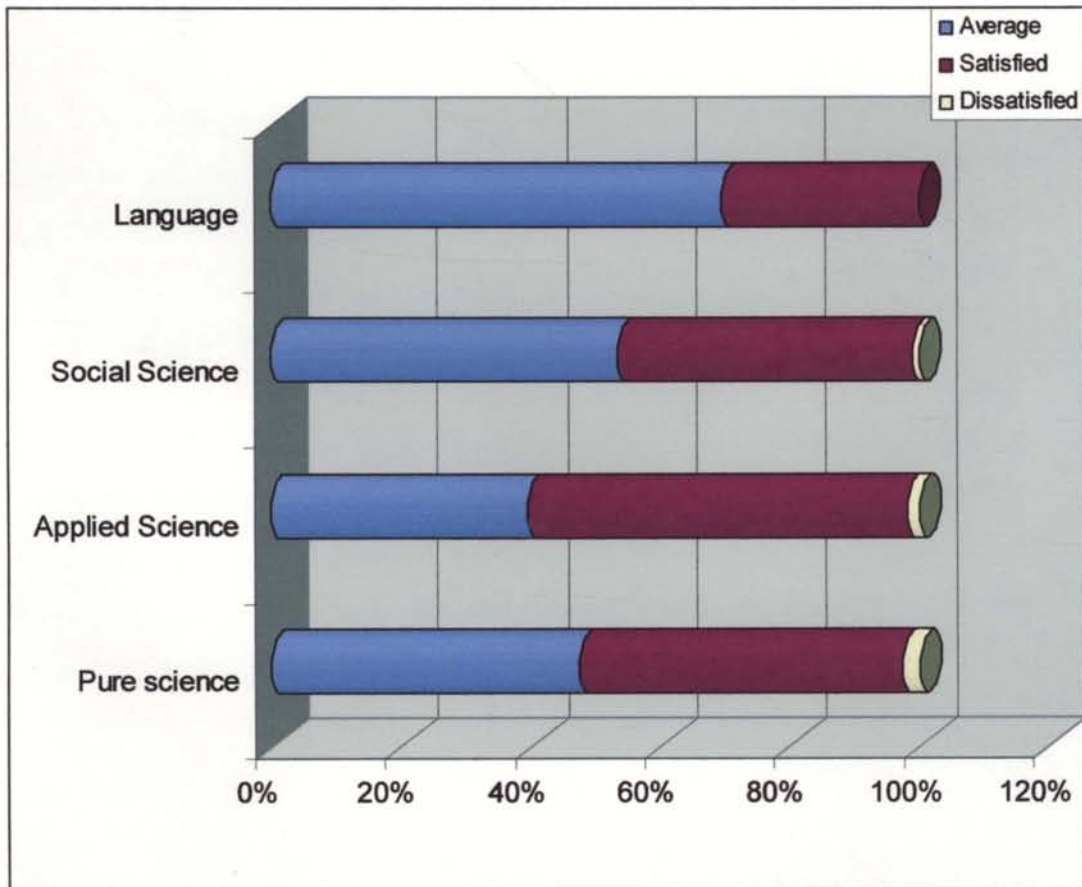
Table 5. 58 Age vs Satisfaction with the results of search

Age of the respondent	Satisfaction			Total
	Average	Satisfied	Dissatisfied	
Less than 35	37	39	2	78
	47.4%	50.0%	2.6%	100.0%
35-45	45	67	2	114
	39.5%	58.8%	1.8%	100.0%
45-55	62	53	1	116
	53.4%	45.7%	.9%	100.0%
Above 55	16	7		23
	69.6%	30.4%		100.0%
Total	160	166	5	331
	48.3%	50.2%	1.5%	100.0%

	69.6%	30.4%		100.0%
	160	166	5	331
<b>Total</b>	48.3%	50.2%	1.5%	100.0%

Table 5.58 portrays the satisfaction with the results of internet search. It shows that 50.2% of university faculty members are satisfied with the results of the internet search. Among the rest, 48.3% are satisfied with the results. However, 1.5% are dissatisfied with the results.

**Fig. 5.13 Satisfaction with the results of internet search**



Age-wise distribution of the Satisfaction with the results of the search depicts that among those satisfied with the results, those in the age group of 35-

to the age group of above 55 yrs with 69.6%. Those between 45-55 yrs followed it with 53.4%.

Inter discipline distribution depict that 61.1% of the Pure Science faculty members are satisfied with the results of the internet search. Those in the Applied science category seconded with 50.4% expressing satisfaction. Among those who reported average satisfaction, the discipline of Language had a greater representation with 57.9% followed by those in the applied science category with 49.6%.

Dissatisfaction is reported only from the Language and Social science disciplines. 3.7% and 3.4% of the faculty members from the Social science and Language disciplines expressed dissatisfaction with the results of the search.

The chi-square results between the age and the satisfaction with the results of the internet search show that that there is no statistically significant association between the two as . Chi-square value of 9.876 is non significant with degrees of freedom 6. The significant value of 0.13 is greater than the assumed value of 0.05 indicating lesser relationship.

However, the association between category and the satisfaction level showed a comparatively strong association between the two as the calculated chi-square value of . 13.294(a) is significant at p value of 0.039. the significant value of 0.039 is lesser than .05 indicating a strong association between the category and the satisfaction of the results of the internet search.

Satisfaction level according to gender showed that comparatively a higher percentage of women than men reported that they are satisfied with the results of the internet search. While 53.8% of the women expressed their satisfaction at the result of the search the corresponding figure for male in this regard was only 46.5%. Moreover, those who reported dissatisfaction with the results was found only in the male group with 2.9%.



The results of the chi-square test between gender and the satisfaction with the results show that there is no statistically significant relationship between the gender and satisfaction of the results of the internet search. (chi square with 2 degrees of freedom,  $p=0.055$ ). The p value of 0.055 is greater than 0.05 depicting that the gender of faculty members and the results of the internet search is not related.

Similarly, the Chi-square test between years of service and the satisfaction with the results of the internet search show that the satisfaction level does not differ according to the difference in the years of service. The calculated p value of 0.232 is greater than the assumed significant value of 0.05 with 8 degrees of freedom. As the calculated significant value of p i.e., 0.232 is greater than the expected value 0.05, it is arrived that they one do not differ according to the other.

## Problems in internet searching

**Table 5.59 Problems faced by faculty members while internet searching**

Difficulties	Pure science	Applied science	Social Science	Language	Total
					N-331
<b>Slow access speed</b>	44	73	46	40	203
	71%	61.9%	59.7%	76.9%	61.3%
<b>Difficulty in finding relevant information</b>	17	68	47	22	154
	27.4%	57.6%	61.0%	42.3%	46.5%
<b>Overload information</b>	32	45	35	12	124
	51.6%	38.1%	45.5%	23.1%	37.5%
<b>Long time to view/download</b>	20	59	37	23	139
	32.3%	50%	48.10%	44.20%	42%
<b>Privacy problem</b>	18	31	18	15	82
	29%	26.3%	23.4%	28.8%	24.8%
<b>Lack of IT knowledge</b>	5	28	17	26	76
	8.1%	23.7%	22.1%	50%	23%
<b>Frequent disconnection of server</b>	22	41	24	19	106
	35.5%	34.7%	31.2%	36.5%	32.0%
<b>Insufficient time</b>	18	48	34	19	119
	29%	40.7%	44.2%	36.5%	35.9%

Concerning the problems encountered while using internet most of the faculty members (65.7% ) stated slow access speed as the major problem. Difficulty in finding relevant information and taking long time to view /download pages are the next two major problems reported by the faculty members with 49.8% and 45% respectively. The other problems cited by them are overload of information on the internet (40.1%), insufficient time (38.5%), frequent disconnection of server (34.3%), privacy problem (26.5%) and lack of It knowledge to effectively utilize the services ( 24.6%).

Regarding the variation according to category, it is seen that slow access speed is reported highest by the Applied Science category with 36% followed by Social Science and Pure Science with 22.7% and 21.7% respectively.

Difficulty in finding relevant information too is reported by majority of the faculty members from the Applied and social science with 44.2% and 30.5% respectively.

With regard to the other problems too it is found that those from applied science and social science outnumbered the others in reporting the various problems. Probably, it is they who use it most frequently and extensively as they had to find out the latest application of various theoretical frame works in the society.

The reason is due to in-depth training and information on accessing and browsing the internet could reduce much of the stated problems of the faculty members of the various universalities in Kerala.

## Comparison of Internet and Conventional Documents

**Table 5.60 Discipline wise comparison between Internet and Conventional Documents**

	Pure science	Applied Science	Social Science	Language	Total
<b>Time</b>					
<b>Time Saving</b>	64	105	57	38	264
	88.90%	86.80%	70.40%	66.70%	79.80%
<b>Time Consuming</b>	8	16	24	19	67
	11.10%	13.20%	29.60%	33.30%	20.20%
<b>Information</b>					
<b>More information</b>	57	87	56	33	233
	79.20%	71.90%	69.10%	57.90%	70.40%
<b>Less information</b>	15	34	25	24	98
	20.80%	28.10%	30.90%	42.10%	29.60%
<b>Cost</b>					
<b>More Expensive</b>	10	19	23	9	61
	13.90%	15.70%	28.40%	15.80%	18.40%
<b>Less expensive</b>	62	102	58	48	270
	86.10%	84.30%	71.60%	84.20%	81.60%
<b>Usefulness</b>					
<b>More useful</b>	49	86	57	30	222
	68.10%	71.10%	70.40%	52.60%	67.10%
<b>Less useful</b>	23	35	24	27	109
	31.90%	28.90%	29.60%	47.40%	32.90%

<b>Preferences</b>					
<b>More preferred</b>	45	75	38	20	178
	62.5%	62.0%	46.9%	35.1%	53.8%
<b>Less preferred</b>	27	46	43	37	153
	37.5%	38.0%	53.1%	64.9%	46.2%

Table 5.60 brings out a comparison between internet and conventional documents in terms of time, information, cost, and usefulness. The study also depicts the differences in the opinion of faculty members of various disciplines.

With respect to the time factor, the internet and conventional documents portrayed a great deal of difference as 79.8% of the faculty members across the different disciplines suggested that use of internet saves lots of time in comparison to the conventional documents.

Among the different categories/ disciplines it is found that a higher number (88.9% and 86.8%) from pure science and Applied Science disciplines stated that the use of internet is time saving. The least in this regard is reported from the language discipline with (66.7%).

Concerning information output through internet and conventional documents it is seen that 70.4% of the faculty members stated that internet provided more information than conventional documents. The remaining, 29.6% opined vice versa.

Here again it is the pure science category that had highest number of faculty members (79.2%) who responded that internet provided more information than other documents. Those from Applied science category seconded the above with 71.9%.

Comparison of cost with respect to Internet and conventional documents the table portray that Internet is considered to be less expensive by a vast majority ( 81.6%) of the respondents under study. On the other hand for 18.4% it is found to be more expensive.

Among those who mentioned the cost of internet use as less expensive, Pure science category topped with 86.1% closely followed by 84.3% and 83.2% of faculty members from applied science and language discipline stating less expensive.

Regarding the usefulness of internet in comparison to the conventional documents, it is found that 67.1% of the faculty members are of the opinion that internet is more useful than conventional documents. 32.8% however had an opinion that it has less usefulness.

Discipline-wise, it was the faculty members from the Applied Science that had a higher representation (71.1%) among who responded as more useful. Faculty members from the social science discipline closely followed the afore with 70.4% Least usefulness is reported from a higher number of faculty members from the language discipline with 52.6%.

Regarding the preferences given to internet 53.8% of faculty members preferred internet than conventional documents, while 46.25 still preferred conventional documents.

62.5% of Pure science and 62% Applied science faculty members preferred internet. In the case of Social science faculty members 46.9% preferred internet. Only 35.1% of language faculty members preferred internet.

On the whole the comparison indicate that for a major group of the faculty members, the internet is found to be time saving, more informative, more useful and less expensive. Probably, it is these advantages in the internet that has made it more popular and its use expensive.

**The summary of findings are described in the next chapter.**

## **Chapter VI**

### **Findings and Conclusion**

#### **6.1 Summary of major findings**

##### **Source of information about Internet**

According to the faculty members Newspaper is emerged as the most common source of information regarding internet. Television is the second major source for internet information. Friends/Colleagues also play a major role in providing information regarding internet. The other sources of information are books, journals and educational institutions like schools, colleges, universities, parents, relatives, and teachers.

##### **Internet Literacy**

Majority of the respondents were intermediate with respect to internet literacy. Experts and Novice constituted 18.4% and 12.4% respectively.

##### **Importance of Internet services**

Faculty members reported that telnet connections, discussion groups and e-news papers are the most important services of internet.

##### **Influence of internet on academic efficiency**

Regarding the influence of internet in academic efficiency most of the faculty members agree that internet provides wide range, updated and faster access of information.

##### **Suitable time for browsing**

51.4% of faculty members opined that there is no particular time which is considered as suitable for browsing. Usually 51.4% browsed 'whenever there was a necessity'. Among the rest, (17.8%) stated 'night' as the suitable time for browsing.



### **Quality of Students work**

79.2% of faculty members have stated that use of internet services have improved the quality of students' work. 6% however reported that the use of internet has not affected the quality of students' work. Only a few (5.1%) responded that the quality of students' work has become worse by the use of internet.

### **Contribution of Internet in improving academic efficiency**

55.9% of the university faculty members reported that internet has contributed a great deal in improving the academic efficiency. 37.8% however stated of a fair amount of improvement in academic efficiency by using internet resources. 6.3% reported of a little amount of improvement in academic efficiency.

### **Positive impact of interaction with students**

51.4% and 24.5% of faculty members 'agreed' and 'strongly agreed' on the positive impact of internet in the interactions with students respectively. However, 4.5% and 0.9% respectively disagreed and strongly disagreed on the same. 18.7% took a neutral approach regarding their opinion.

### **Self rating of internet skills**

Around half (51.4%) of university faculty members rated of having average proficiency in internet skills. 34.1% and 6.3% rated their proficiency as high and very high in this regard. 7.9% of faculty members reported of low internet skills.

### **Attitude towards internet**

Concerning the attitude level, better attitude towards internet use was comparatively high among the Pure Science respondents with 70.9%. Lowest in this regard was reported by Social Science group with 55%. Those who secured medium score (88-112) was reported from social science group with 43.8%. Those from Language group followed it with 42.1%. Those who secured highest between 136-160 were reported by the Pure Science group with 15.3% followed by Applied Science category with 8.3%.

### **Period of utilization of internet**

Among the university faculty members 74.9% are using internet for more than 4 years. 10.9% are using for 2-4 years. Nevertheless, 9.4% are using only for less than 6 months. 3.3% and 1.5% are using between 1-2 years and 6 months-1 year respectively.

### **Frequency of using internet**

53.2% of faculty members are using internet daily. Browsing 2-3 times a week seconded it. Applied Science faculty members are using internet daily than faculty members from other disciplines.

### **Time spend for internet browsing**

34.4% spent 2-4 hours a week for browsing internet. 5-6 hours followed it with 16.6%. Those who spent long hours of browsing hailed at a greater number (36.6%) from Applied Science discipline.

### **Place of browsing**

Home was reported as the most common place of browsing. Dial up connection was the mode used. Those who are browsing at home figured prominently from the Applied Science category.

### **Acquirement of internet skill**

A good number (54.1%) of faculty members seek supports from their colleagues for learning about internet skills. Trial and error method for learning internet skills was followed it by 48.3%. Self learning about internet was reported by 33.8%.

### **Information seeking activities**

Most of the respondents (92.1%) used the internet service for research and education. Those who used it for seminar/conference information and for lecture preparation constituted 74% and 70.4% respectively. Internet is also considered as a

medium for publishing information. Other purposes for which internet was used included: job hunting, searching library and information seeking services.

### **Communication activities**

Majority ( 64.4%) reported that internet was commonly used for communicating with overseas friends. For communications with overseas educational institutions followed it with 60.1%. Internet as medium of communication between Faculty members and students was reported low.

### **Frequency of internet service usage**

Vast majority (83.08%) of the faculty members are irregular users of internet.

### **Purpose of internet information**

According to faculty members, the information received through the internet are mostly used for research and teaching. Guiding research as the purpose was mentioned by only a handful of numbers. A few faculty members are using internet for publication information.

### **Search Engines**

74.3% of faculty members mentioned that Google as the most frequently used search engine. With respect to priority given among the search engines all the faculty members give first priority to Yahoo. Google stood next to Yahoo.

### **Mode of browsing internet**

A vast majority of faculty members used Search engines and web addresses for browsing the internet.

### **Impact of internet on teaching efficiency**

45.3% of the faculty members reported that use of internet has a good impact on their teaching. Very good impact is reported by 27.5% of the faculty members. Average

level of impact was stated by 21.5% of the faculty members across the various disciplines.

### **Contribution of internet in information and communication needs**

43.2% faculty members mentioned that internet contributes a great deal with respect to information needs. 42.9% stated the contribution as immeasurable and 13.9% mentioned the contribution as a fair amount.

Regarding the contribution to communication needs, 49.2% reported it as great amount, 36% immeasurable and only 14.8% reported a fair amount in this regard.

In short, internet contributes a great deal to faculty member's information and communication needs.

### **Adequacy of internet information needs**

80.7% of faculty members mentioned that they are getting adequate information from internet only sometimes. 12.4% of faculty members reported the receipt of adequate information always. However, 6.9% reported that they never received adequate information.

### **Reliance on internet services**

33.5% of university faculty members reported of 50%-74% of dependence on internet for various communication and information needs. Dependence between 75%-99%, 25-49% were stated by 27.2% and 16.6% respectively. Only 2.7% of faculty members have cent percent assurance to internet services.

### **Desirability of internet services**

48.6% of university faculty members mentioned that the internet is required for bibliographical databases. 40.2% opined that uses of internet for bibliographical databases are only desirable. 11.2% mentioned that internet is not required for bibliographical databases.

### **Availability of internet services**

Only 90% affirmed on the availability of internet facility at their university. The remaining, 10% do not get the internet facility at their university libraries.

### **Availability of database in the library**

75.5% of university faculty members have getting databases while 24.5% do not get the availability of databases in their university libraries.

### **Awareness of contents of e-journals**

Regarding the awareness on the subject content of the e-journals, only 45% of university faculty members responded in the positive. 36.6% did not have any awareness on the subject contents of e-journals in their university libraries. Only 18.4% of faculty members were aware of the content of e-journal of many subjects subscribed in their university libraries.

### **Use of electronic databases**

Only 45.9% of faculty members are using the electronic database available in the university library web pages. The rest, i.e., 54.1% are not using the electronic databases in the university library web pages.

The major purpose for which electronic databases in the web pages of university library used is for research activities. Other purposes for which they were used are lecture preparation and full text access of information.

#### **Non use of electronic databases**

Regarding the of non of use of electronic databases, faculty members mentioned that non awareness on the use of electronic databases is the major reason. Another reason is that they meet information from other sources.

#### **Replacement of Library Services**

A vast majority (94.3%) of the faculty members in the universities of Kerala reported that the internet services will not replace the library services. Only 5.7% have mentioned that the new information technology "INTERNET" will replace the library services.

#### **Satisfaction of internet results**

Half (50.2% ) of university faculty members are satisfied with the results of internet search. Among the rest, 48.3% are quite (average) satisfied. A few (1.5%) are dissatisfied with the results of the internet search.

#### **Problems encountered by Faculty members**

Slow access speed, difficulty in finding information, long time for downloading information are the problems faced by the faculty members with respect to internet utilization.

### **Internet Vs conventional documents**

Comparing internet with conventional documents, and time as a factor of comparison, 79.8% of faculty members mentioned that internet is time saving while 20.2% stated internet is time consuming.

In the level of information 70.4% of faculty members agreed with the fact that internet is more informative. On the other, 29.6% of faculty members stated it to be less informative.

Regarding the cost of internet services, 81.6% of faculty members have the opinion that it is less expensive and 18.4% have the opinion of more expensive.

About the usefulness, 67.1% mentioned that internet is more useful and 32.9% mentioned that internet is less useful.

Regarding preference level, 53.8% of faculty members preferred internet than conventional documents and 46.2% of faculty members preferred conventional documents.

## 6.2 Tenability of Hypotheses

On the basis of the findings drawn out of the study, the tenability of the hypotheses formulated for the study is tested.

### Hypothesis 1 The Knowledge regarding internet varies according to category

**ANOVA test between Knowledge and various disciplines of faculty members**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	216.910	3	72.303	11.795	.000
<b>Within Groups</b>	2004.528	327	6.130		
<b>Total</b>	2221.438	330			

The knowledge on internet varies from person to person, discipline to discipline. The ANOVA test between category/discipline and the knowledge level of the faculty members of various departments across the universities in Kerala proves the same. The F value of 11.795 is significant at 0.000 resulting in the rejection of the null hypothesis and accepting the alternative hypothesis. The means of the two variables differs and are found to be significant. The findings of Table 5.7 are related to this hypothesis.



**Hypothesis 2 Attitude towards Internet is positively related to years of service**

**ANOVA test between attitude and years of service of faculty members**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>Between Groups</b>	2120.066	4	530.016	3.431	.009
<b>Within Groups</b>	50045.484	324	154.461		
<b>Total</b>	52165.550	328			

Years of service is a parameter to assess the proficiency of the faculty members in their specific field. Often they are in search of more and more knowledge from various sources. Internet has been one of the sources of information and communication which have been used widely. The ANOVA test done with respect to years of service and the attitude of the faculty members towards the internet show that the means of the two variables do differ significantly meaning that one affects the other. The F ratio 3.43 is found to be significant at 0.009 wherein it rejects the null hypothesis and accepts the alternative. The results of internet use attitude scale are related to this hypothesis.

**Hypothesis 3 Higher the duration of using internet higher the attitude towards internet**

**ANOVA test between the duration of using internet and attitude**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>Between Groups</b>	3174.208	4	793.552	5.248	.000
<b>Within Groups</b>	48991.342	324	151.208		
<b>Total</b>	52165.550	328			

The results of ANOVA on the duration of using internet and the attitude of the faculty members towards internet show that the means of both differs significantly whereby the null hypothesis is rejected and the alternative hypothesis is accepted. The F-value of 5.248 is significant at 0.000 which is lesser than the assumed p value of 0.05. This shows as faculty members spent more time in front of the internet they become aware of the vast potentialities of the internet which naturally build up a positive attitude towards attitude. The findings of Table 5.30, time spent for using internet is related to this hypothesis.

**Hypothesis 4 Higher the Internet literacy better the search results.**

**ANOVA test between the internet literacy and search results**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	5.437	2	2.719	10.246	.000
<b>Within Groups</b>	86.760	327	.265		
<b>Total</b>	92.197	329			

Satisfaction with the internet search results is boosting factor for the pursuance in the use of the internet further. The results of search often depends on the internet literacy of the faculty members. The results of the ANOVA test to verify the hypothesis' Higher the Internet literacy better the search results' rejects the null and accepts the alternative as it is seen from the test table that the F value of 10.248 is found to be significant at 0.000. The test result shows that as the internet literacy increases the faculty members have an increased satisfaction on the results of the search on internet. The results of Table 5.6, internet literacy is related to this hypothesis.

**Hypotheses 5 : Higher the Internet literacy higher the influence on teaching efficiency**

**ANOVA test between the Internet Literacy and the impact on Teaching efficiency**

	Sum of Squares	df	Mean Square	F	Sig.
<b>Between Groups</b>	186.145	2	93.073	18.574	.000
<b>Within Groups</b>	1643.565	328	5.011		
<b>Total</b>	1829.710	330			

The stated hypothesis is proved by calculating the significant difference in the teaching efficiency of those who are novice, intermediate and experts in the field of internet literacy. The test results show that the teaching efficiency is significantly different according to the Internet literacy as the F value of 18.574 is found to be significant at degrees of freedom 2. The F value is found to be significant at 0.000, which is much less than the assumed value 0.05. The results thus reject the null hypothesis and accept the alternative hypothesis. The acceptance of the hypothesis point to the importance of using Internet for acquiring and utilizing knowledge and information in order to improve the teaching efficiency. The findings of Table (5.6 &41), internet literacy, internet and teaching are related to this hypothesis.

### **6.3 Suggestions**

1. Provide internet literacy to all the faculty members from the grass root level.
2. Formal training regarding all possible internet resources and the techniques of conducting search strategy to filter information from internet.
3. Universities may set up an internet centre and provide many f broad band access points to each department for faculty members.
4. Seminars and Workshops may be organized periodically at the regional as well as the national level.
5. The faculty members have to change their attitude towards the new information technology “INTERNET”.
6. Encourage faculty improvement programs to emphasize the integration of technology into instructional formats that utilize internet.
7. Promote the utilization of internet services for dissemination of information such as research findings, article publications, communication with students etc.
8. Encourage students to use internet resources to prepare for seminars and paper presentations.
9. Encourage studies on newly emerging information and telecommunication technologies.
10. University authorities should take initiatives to subscribe electronic databases in concerned subjects through internet.
11. The university libraries should prepare a list of websites on different subjects useful to their university departments.
12. Faculty members should develop a positive attitude towards internet services.
13. University Grants Commission and Heads of Universities should ensure the maximum facilities of internet to the faculty members in this modern information age.
14. Encourage faculty members to create their own websites, which include their professional details, academic back grounds and through this they can publish research findings, articles etc.

#### **6.4 Further Area of Research**

The internet utilization of all the faculty members in the universities, as well as in the affiliated colleges can be selected for the research. By taking the faculty members in universities and colleges, the comparison between these two groups can be studied. Similarly the internet use pattern of research scholars can also be studied.

#### **6.5 Conclusion**

Today, scientific research is throwing up new discoveries, inventions and vistas by the hour. We are witnessing a veritable knowledge explosion. It is important for members of university faculty members to keep abreast of it for giving up-t-date information to their students about the new development in the subject of their study. The internet is an invaluable tool for achieving it.

Most of the universities have sufficient internet facility, but the accessibility to all the faculty members is not adequate. University Libraries also provides standard supplementary service in the internet area. This study indicates differential level of awareness and utilization of the internet services by the faculty members in the areas of teaching, research and publication. However the overall impression is that the awareness and utilization is inadequate.

This point to the urgent need to devise programs and schemes to promote internet utilization among the faculty members. The suggestions indicate the key areas that deserve attention by policy makers and administrators. Thanks to the internet, every new development in every field of study is just a click away for faculty members, research scholars and students.

## Bibliography

- Abdoulaye, Kaba & Majid, Shaheen (2000). Use of the Internet for reference services in Malaysian academic libraries. *Online Information Review*, 24 (5), 381-289.
- Adam, L., & Wood, F. (1999). An investigation of the impact of information technology in Sub-Saharan Africa. *Journal of Information Science*, 25 (4), 307-318.
- Agnew, Grace.B. (1996). The Internet initiative at the Atlanta-Fulton public library. *DESIDOC Bulletin of Information Technology*, 16 (1) , 25-29.
- Ajuwon, G.A. (2006). Use of internet for health information by physicians for patient care in a teaching hospital in Ibadan, Nigeria. *Biomedical Digital Libraries*, 3(12), Retrieved September 9, 2008 from <http://www.webology.ir/2005/v2n1/a10.html>.
- Kaur, Amritpal (1999). Use of computer and CD-ROM in the libraries of agricultural universities and research institutes in the states of Punjab, Haryana and Himachal Pradesh: a study. *ILA Bulletin*, 32 (3-4), 5-10.
- Asemi, Asefeh (2005). Information searching habits of internet users : A case study on the Medical sciences University of Isfahan, Iran. *Webology*, 2(1), Retrieved September 9, 2007 from <http://www.webology.ir/2005/v2n1/a10.html>
- Baby, M.D. (Ed.) (2000). *Changing trends in library and information science* . New Delhi: Ess Ess Publications.
- Bajpai, S.K. (1999). *Library information technology management*. New Delhi: Ess Ess Publications.
- Bakardjieva, Maria (2006). *Interent society : the internet in everyday life*. London: Sage Publications.
- Bane, Adele F., & Milheim, William D. (1995) Internet insights: how academics are using internet. *Computers in Libraries*, 15 (2) 32-35.
- Banga, K. ,& Padda, A.S. (2004). A study of knowledge attitude and practices of faculty members of govt. Medical College, Amritsar regarding the use of computers. *Indian Journal of Medical Informatics*, 1(2), Retrieved September 9, 2007 from <http://iami.org.in/journal1/knowledge.asp>

- Barlow, Lisa J., & Graham, Margaret E. (1999). The use of information and communication technologies in commercial libraries in the UK. *Program*, 33 (2), 109-128.
- Barlow, Lisa J., & Graham, Margaret E. (1999). The use of information and communication technologies in commercial libraries in the UK. *Program*, 33(2),109-128.
- Basandra, Suresh K., & Jaiswal, S. (2007). *Local area networks*. New Delhi: Galgotia Publishers.
- Bavakutty, M., & Varghese, Rekha Rani (2007). *Information search pattern in electronic environment*. New Delhi: Ess Ess Publications.
- Bavakutty, M., & Salih Muhamad, T.K. (1999). Internet services in Calicut University. In *Proceedings of the 6<sup>th</sup> National Convention on Academic Libraries in the internet era*, Ahemdabad, India, 37-44.
- Bazac, D. (2003). Tips, techniques and strategies, 2003. Retrieved August 27, 2008, from [www.web-design-in-new-york.com/search-the-Web.html](http://www.web-design-in-new-york.com/search-the-Web.html)
- Bertot, John Carlo, & McClure, Charles R. (1997). Impacts of public access to the Internet through Pennsylvania public libraries. *Information Technology and Libraries*, December, 151-164.
- Betgman, M.K. (2001). The deep web : Surfacing hidden information. *The journals of Electronic Publishing*, 7(1). Retrieved September 1, 2007 from <http://www.press.umich.edu/jep/07-01/bergman.html>
- Biddiscombe, Richard (2001). The development of information professionals' needs for internet and IT skills: experiences at the university of Birmingham *Program*, 35(2), 157-166. Retrieved January 28, 2008 from <http://haly.emeraldinsight.com/vl=859682/cl=18/nw=1/rpsv/~5999/v35n2/s4/p157>
- Bishop, A.P. (1994). The role of computer networks in aerospace engineering. *Library Trends*, 42(4), 694-729.



- Blumberg, P., & Sparks, J. (1999). Tracing the evolution of critical evaluation skills in students' use of the internet. *Bulletin of the Medical library Association*, 87(2), 200-205.
- Brock, Jurgen Kai-Uwe (2005). Organizational use of the internet : Scale development and validation. *Internet Research*, 15(1), 67-87.
- Brooks, Terrence A. (2003). Web search : How the web has changed information retrieval. *Information Research* 8(3). Retrieved February 1, 2008 from <http://Information R.net/ir/8-3/paper154.html>
- Bruce, Harry (1998). User satisfaction with information seeking on the internet. *Journal of the American Society for Information Science*, 49(6), 541-545.
- Buchanan, William (1997). *Mastering the internet*. London: Macmillan Publications.
- Bukhari, A. A. & Meadows, A. J. (1992). The use of information technology by scientists in British and Saudi Arabian universities: a comparative study. *Journal of Information Science*, 18, 409-415.
- Burton, P.F. (1999). Information professionals and the world wide web. *Online and CD-ROM Review*, 23 (2), 103-104.
- Carrasco, Laura Ortega & Vanderkast, Egbert Sanchez. (1998). The information professional in a networked society. *Aslib Proceedings*, 50 (5), 95-99.
- Chang, N.C., & Perng, J.H. (2001). Information search habits of graduate students at Tatung University. *International Information & Library Review*, 33(4), 341-346.
- Chowdhury, G.G. (1999). *Introduction to modern information retrieval*. London: Library Association Publishing.
- Ciolek, M.T. (1998). The scholarly uses of the internet: 1998 online survey. Retrieved March 26, 2008, from <http://www.ciolek.com/papers/internetsurvey-98.html>
- Cooper, Michael D. (2001). Use patterns of web based catalogues. *Journal of the American Society for Information Science and Technology*, 52(2), 137-148.
- Corner, E.D. (2000). *Internet*. New Delhi: Prentice Hall.

- Costa, Sely & Meadows, Jack (2000). The impact of computer usage on scholarly communication among Social scientists. *Journal of Information Science*, 26(2), 255-262.
- Cothey, Vivian (2002). A longitudinal study of World Wide Web users' information seeking behaviour. *Journal of the American Society for Information science and Technology*, 53(2), 67-78.
- Cronin, B. (1998). Information professionals in the digital age. *International Information and Library Review*, 30, 37-50.
- Cronin, B., & Overfelt, K. (1995). E-journals and tenure. *Journal of the American Society for Information Science*, 46 (9), 700-703.
- Cullen, Rowena. (2003) The digital divide: A global and national call to action. *The Electronic Library* 21 (3), 247-257. Retrieved March 21, 2008, from <<http://ariel.emeraldinsight.com/vl=7697037/cl=54/nw=1/fm=html/rpsv/cw/mcb/02640473/v21n3/s7/p247>>
- Darch, Colin, & Underwood, Peter G. (1999) Dirt road or yellow brick superhighway? information and communication technology in academic libraries of South Africa. *Library HiTech* 17 (3), 285 – 298. Retrieved March 21, 2007 from <<http://ariel.emeraldinsight.com/vl=6997816/cl=101/nw=1/rpsv/~1137/v17n3/s8/p285>>
- Dawson, A. (1997). *The internet guide for new users*. New York: McGraw Hill.
- Day, J., & Bartle C. (1998). The internet as an electronic information service: its impact on academic staff in higher education. Retrieved September 9, 2008, from <HTTP://www.sosig.ac.uk/iriss/papers/paperob.htm>.  
December, 22-29.
- Dem, Daniel (1994). *The internet guide for new users*. New York: McGraw Hill.
- Devarajan, G. (1999). *Information technology in libraries*. New Delhi: Ess Ess.
- Dickstein, Ruth., Greenfield, Louise. & Rosen, Jeff. (1997) Using the world wide web at the reference desk. *Computers in Libraries*, September, 61-66.
- Dong, X. (2003). Searching information and evaluation of internet : A chinese academic user survey. *International Information & Library Review*, 35(2-4), 163-187.

- Dutton, William H. (2004) Information and communication technologies: visions and realities. *Information Technology & People* 12 (1), 113 – 115. Retrieved January 24, 2008, from <<http://ariel.emeraldinsight.com/vl=6997816/cl=101/nw=1/rpsv/~1188/v12n1/s2001/p113>>
- Edwards, S.L., & Bruce, C.S. (2002). Reflective internet searching : An action research model. *The learning organization : an international journal*, 9(4), 180-188.
- Ellis, D. Cox, D. & Hall, K. (1993). A comparison of the information seeking patterns of researchers in the physical and social sciences. *Journal of Documentation*, 49(4), 356-369.
- Eskola, Eeva-Lisa (1998). University students' information seeking behaviour in a changing information environment. *Information Research*, 4(2). Retrieved September 1, 2008 from <http://shef.ac.uk/is/publications/infres/isic/eeskolas.html>
- Falk, H. (1997). World Wide Web and retrieval. *Electronic Library*, 15,(1), 27-35.
- Fernandez, L. (1999). Scholarly communication in the sciences : A third world perspective. *Internet Reference services Quarterly*, 4(4), 19-27.
- Ford, Nigel , Miller, David & Moss, Nichola (2002). Web search strategies and retrieval effectiveness : An empirical study. *Journal of Documentation*, 58(2), 30-48.
- Forouzan, Behrouz A . & Fegan, Sophia Chung (2008). *TCP/IP Protocol suite. (3<sup>rd</sup> ed.)* New Delhi: Tata McGraw-Hill.
- Furness, Karen L. & Graham, Margaret E. (1996) The use of information technology in special libraries in the UK. *Program*, 30 (1), 23-37.
- Gibson, S. & Oberg, D. (2004). Visions and realities of internet use in schools : Canadian perspectives. *British Journal of Educational Technology*, 35(5), 569-585.
- Goldberg, A.B. (2004). *Internet & World Wide Web : How to program. (3<sup>rd</sup> ed. )*. New Delhi : Pearson Education.
- Griffiths, Jillian R & Brophy, Peter (2001). Students search in behavior and the Web : Use of academic resources and Google, *Library Trends*, 537-544.
- Grimes, Deborah, & Boening, Carl, H. (2001). Worries with the web : A look at student use of web resources. *College and Research Libraries*, 62(1), 11-21.

- Gustitus, Cheryl. (1998) The push is on: What push technology means to the special librarian. *Information Outlook*, 21-25.
- Hewitson, Andrew (2002). Use and awareness of electronic information services by academic staff at Leeds Metropolitan university-a qualitative study. *Journal of Librarianship and Information Science*, 34 (1), 43-52.
- Hewitson, Andrew. (2002) Use and awareness of electronic information services by academic staff at Leeds Metropolitan University-a qualitative study. *Journal of Librarianship and Information Science*, 34 (1) March, 43-52.
- Hicks, D., Doolittle, P., & Lee, J. (2004). Social studies teachers' use of classroom based and Web-based historical primary sources. *Theory and Research in Social Education*, 32(2), 213-247.
- Hiller, Steve. (2002) .The impact of information technology and online library resources on research, teaching and library use at the university of Washington. *Performance Measurement and Metrics: The International Journal for Library and Information Services*. Retrieved January 27, 2008 from  
<<http://ariel.emeraldinsight.com/vl=7697037/cl=54/nw=1/fm=html/rpsv/cw/mcb/14678047/v3n3/s3/p134>>
- Hsieh-Yee, Ingrid. (1996). Student use of online catalogs and other information channels. *College and Research Libraries*, 57 (2), 161-175.
- Iyer, V.K (1999). *Library information technology tools of tomorrow* (1999). Delhi: Rajat.
- Jansen, B.J. (2001). Web use studies : a review and framework for future work. *Journal of American Society for Information Science and Technology*, 52 (3), 235-246.
- Jyothi M., & Satyanaranya N.R. (2001). Uses of internet in a university library : A case study. *ILA Bulletin*, 37(4), 132-134.
- Kaminer, N. (1999). Scholars and the use of the internet. *Library and Information Science Research*, 19 (4), 329-345.
- Kannappanavar, B.U. & Vijayakumar, M. (2001) Use of IT in university of agricultural science libraries of Karnataka: a comparative study. *DESIDOC Bulletin of Information Technology*, 21 (1), 21-26.

- Kanungo, Neena Talwar (2007). Use of internet in the scholarly communication of social scientists : a case study of IGNOU. *Annals of library and information studies*, 54, 7-10.
- Kawatra, P.S. (2000). *Textbook of information science*. New Delhi: A.P.H. Publications.
- Kennedy, P. (2004). Dynamic web pages and the library catalogue. *The Electronic Library*, 22(6), 480-486.
- Kogannurmath, M.M., & Jange, Suresh (1999). Use of internet by Social Science research scholars: a study. IN: Proceedings of the Sixth National Convention for the *Automation of Libraries in Education and Research on Academic libraries in Internet Era*, 18-20 February, Nagpur. Ahmedabad, INFLIBNET Centre. 239-245.
- Kumbar, M., Kumar, N.G., Raj, N.V. & Praveen J.K. (2005). Use of electronic resources by research scholars in CFTRI, Mysore : A case study. *ILA Bulletin*, 41(3), 16-20.
- Lazonder, Ard W., Biemans, Harm J.A. & Wopereis, G.J.H. (2000). Differences between novice and experienced users in searching information on the world wide web. *Journal of the American Society for Information Science*, 51 (6), 576-581.
- Leon, Alexis & Leon, Mathews (2000). *Internet in a nutshell*. Chennai: Leon Techworld.
- Lowe, Doug (2001). *Internet explorer 4: Browsing and beyond*. New Delhi: Tata McGraw Hill.
- Mahapatra, Rabindra K. (2004). Role of internet in Social science research. *Library Herald*, 42(4), 303-308.
- Malaisamy, T.K. (1998). Information technology in library management and education. *IASLIC Bulletin*, 43 (1), 27-31.
- Marcella, R. (2002). Woman on the web : A critical appraisal of a sample reflecting the range and content of women's sites on the internet, with a particular reference to the support of women's interaction and participation. *Journal of Documentation*, 29, (1), 79-103.
- Mathews, Paula L. (1997) An investigation into internet training for academic library staff. *New Library World*, 98 (3), 84-97.
- Mehta Subhash (1996). *Understanding and using internet*. Delhi: Global Business Press.

- Mishra, O.P., Neelam, Yadava & Kamini, Bisht (2005). Internet utilization pattern of undergraduate students. *University News*, 43(13), 8-12.
- Monopoli, Maria, & Nicholas, David (2000). A user centered approach to the evaluation of subject based information gateways. Case study SOSIG. *Aslib Proceedings*, 52(6), 218-231.
- Nachmias, R., & Gilad, A. (2002). Needle in a hyperstack : Searching for information on the world wide web. *Journal of Research on Technology in Education*, 34, 475-486.
- Neena Singh (2001). Internet : Importance and usage for Library and Information professionals. *DESIDOC Bulletin in Information technology*, 21(3), 17-28.
- Nicholas, D, Huntington, P., Gunter, B., & Russell, C. (2003). The British and their use of the web for health information and advice.: A survey. *Aslib Proceedings*, 55(5-6), 258-260.
- Notess, G.R. (2004). Search engine prefixes and shortcuts. *Online*, 28(3). Retrieved September 10, 2008, from [www.infotoday.com/online/may04/onthenet.shtml](http://www.infotoday.com/online/may04/onthenet.shtml).
- Nyamboga, C.M., Ongonda, M.A. & Raymond, W. (2004). Experiences in the use of the internet at Egerton University Library, Njoro-Kenya, *DESIDOC Bulletin of Information Technology*, 24(5), 11-24.
- O, Neill, E T. (1998) Characteristics of web accessible information. *IFLA Journal*, 24 (2), 114-116.
- Obst, Oliver (1998). Use of internet resources by German medical professionals. *Bulletin of Medical Library Association*, 86(4), 528-533.
- Origgi, Gloria, (Ed.) (2006). *Text-e : text in the age of internet*. New York: Palgrave Macmillan.
- Ormes, Sarah (1998 ). Internet services in Danish public libraries. *Journal of Librarianship and Information Science*, 30 (2), 123-132.
- Panda, K.C & Gautam J.N. (1999). *In'fo Technology (IT) on the cross' roads : from abacus to internet*. Agra: Y.K.Publications.
- Park, H.O, (1996). Use of the internet via universal access workstation. *Internet Reference Services Quarterly*, 1(1), 69-87.

- Poole, Carolyn E. & Denny, Emmett. (2001 November) Technological change in the workplace: a statewide survey of community college library and learning resources personnel. *College and Research Libraries*, 503-515.
- Pope, Markus (1998). *Mastering internet programming*. New Delhi: Galgotia Publications.
- Raman Nair (1999). *Internet for Library and Information services*. New Delhi: Ess Ess Publications.
- Randall, Neil (2002). *Teach yourself the internet in a week*. New Delhi: Prentice Hall of India.
- Ravichandra Rao, I.K. (1997) Impact of recent advances in information technology on collection development. *DESIDOC Bulletin of Information Technology*, 17 (1) January, 3-6.
- Robinson, Jannie W. (2001). Internet use among African-American college students : An exploratory study. Retrieved September 9, 2008, from <http://www.lib.umi.com/dissertations/fulcit/3156015>
- Rowley, Jennifer (1998). *The Electronic Libray*. London: Lirary Association Publishing.
- Ruthven, K., Deaney, R. & Hennessy, S. (2001). Incorporating internet resources into classroom practice : Pedagogical perspectives and strategies of secondary school subject teachers. *Computers & Education*, 44, 1-34.
- Sada, Ellis. (1999). Training users in the electronic era. *Information Outlook*, Internet use in university libraries of Pakistan. Retrieved January 27, 2008 from <<http://haly.emeraldinsight.com/vl=859682/cl=18/nw=1/rpsv/~1184/v24n2/s7/p154>>
- Sah, S.L. (1999). *Information technology*. New Delhi: Gyan Publications.
- Sambasivan, K. (1998) Impact of internet in information technology in India. *Herald of Library Science*, 37 (2-3), 210-213.

- Satyanarayana, Pattnaik & Saravanan, A. (1999) Internet in India: An overview. *Yojna, April*, 44-45.
- Sehgal, R.L. (2000). *Intraent and internet applications for librarians (v.2)*. New Delhi: Ess Ess Publications.
- Shamim Ahmad (1998). *The world of internet*. New Delhi: APH. Publications.
- Shanker Singh, (Ed.) (2000). *World Wide Web : Handbook for librarians*. New Delhi: Ess Ess Publications.
- Shaw, Wendy. (2001). *The use of the internet by academics in the discipline of English literature: a quantitative and qualitative approach*. Retrieved January 2008, from <<http://www.shef.ac.uk/~is/publications/infres/ws8.html>>
- Sooryanarayana, P.S., & Mudhol, Mahesh V. (2000). *Communication technology : its impact on library and information science*. New Delhi: Ess Ess Publications.
- Spink, A., & Jansen, B. (2006). A study of Web search trends. *Webology*, 1(2). Retrieved September 9, 2008 from <http://www.webology.ir/2004/v1n2/a4.html>.
- Starkweather, W.M. & Wallin, C. Clark (1999). Faculty responses to library technology : Insights on attitudes. *Library Trends*, 47, 640-668.
- Stover, Mark (2000). Reference librarians and the internet : A qualitative study. *Reference Services Review*, 28(1), 39-49.
- Su, Shiao-Feng. (1993). Attitudes of academic library professionals towards computer-based systems in Taiwan. *Journal of Librarianship and Information Science*, 25 (3) 143-152.
- Tillman, H.N. (2003). Evaluating quality on the net. Retrieved September 9, 2008 from <http://www.hopetillman.com/findqual.html>.
- Tilloston, J. (1995 September) Internet use through the university of Toronto library: demographics, destinations, and users' reactions. *Information Technology and Libraries*, 14 (3), 190-198.
- Tomney, Hilary, & Burton, Paul F. (1998). Electronic journals : A study of usage and attitudes among academics. *Journals of Information Science*, 24(6), 419-429.
- Tonta, Y. (1996). Scholarly communication and the use of networked information sources. *IFLA Journal*, 22 (3), 240-245.



- Vaughan, Liwen, & Thelwall, Mike (2003). Scholarly use of the web : What are the key inducers of links to journals websites. *Journal of American Society for Information Science and Technology*, 54(1), 29-38.
- Waldman, M. (2003). Freshmen's use of library electronic resources and self-efficacy. *Information Research*, 8(2), 349-355.
- Whittaker, Jason (2002). *Internet : Basics*. London: Routledge.
- Young, Margaret Levine, Doug, Muder , Kay, Dave & Warfel, Kathy (2000). *The complete reference internet*. New Delhi: Tata McGraw-Hill.
- Zhang, Y. (1998). The impact of internet-based electronic resources on formal scholarly communication in the area of library and information science: a citation analysis. *Journal of Information Science*, 24 (4), 241-254.
- Zhang, Yin (1999). Scholarly use of internet based electronic resources : A survey report. *Library Trends*, 47(4), 746-770.

## Appendix

From

Sweety Isaac  
Part Time research scholar,  
Department of Computer Applications,  
Cochin University of science & Technology.

Dear Sir,

This is to seek your co-operation for the research work undertaken by me for the PhD degree. The study aims at assessing the internet use and academic activities of faculty members in the universities of Kerala.

You are chosen as one of the representative persons to collect necessary data for the study. Hence, I request you to be kind enough to fill up the enclosed questionnaire with frank and factual replies. Your co-operation in providing data will be highly appreciated. The data gathered will be used only for the study purpose.

I assure you that the opinion and data collected from you will be kept strictly confidential and no name will be cited for whatsoever.

Thank you,

Sincerely Yours,

Sweety Isaac.

**Internet Utilization and Academic Activities of Faculty Members in the Universities of Kerala : An analytical study**

Research Scholar: Sweety Isaac

Research Guide: Dr. Humayoon Kabir S

Please tick your answers in an appropriate box, provided against each question

Name : \_\_\_\_\_ Designation : \_\_\_\_\_  
 Gender : \_\_\_\_\_ Years of service : \_\_\_\_\_  
 Age : \_\_\_\_\_ Department : \_\_\_\_\_  
 E-mail ID : \_\_\_\_\_ University : \_\_\_\_\_

1. When did you first hear about Internet :

2. Source of information regarding Internet :

3. Internet Literacy :

Novice  Intermediate  Expert

4. Internet services

Please indicate your awareness of the following services being provided on Internet and give your preferences of using these services 1,2,3.....etc.

Sl. No.	Services	Yes	No	Preferences
1	E-mail			
2	WWW			
3	Search Engines (eg. Google)			
4	Remote Login (Telnet)			
5	File Transfer Protocol (FTP)			
6	Archie			
7	Discussion Groups			
8	Bulletin Board Service (BBS)			
9	Frequently Asked Questions			
10	Chatting			
11	Any Other (Specify)			

5. What importance you give to Internet facilities?

Sl. No.	Internet Facility	Very Important	Important	Slightly Important	Not Important
1	E-mail				
2	External Library Catalogues				
3	Bibliographic Databases				
4	E-Journals				
5	E-Books				
6	E-Newspapers				
7	Downloading Software				
8	Discussion Lists				
9	Telnet Connections				
10	Any Other (Specify)				

6. What is your opinion regarding the influence of Internet on academic efficiency?

1. Use of conventional documents has decreased
2. Dependency on the Internet has increased
3. Expedited the research process

- 4. Improved professional competence
- 5. Access to a current up to date information
- 6. Access to a wider range of information
- 7. Faster access to information
- 8. Talk less on phone
- 9. Any other (specify)

**7. What is the suitable time for browsing Internet for information?**

Morning  Noon  Evening  Night  Late Night  Whenever necessary

**8. Has the Internet changed the quality of your student's works?**

- Quality improved
- Quality worsened
- Quality unaffected
- Don't know/No opinion

**9. Comment on the contribution of Internet in improving academic efficiency?**

A great deal  A fair amount  A little

**10. Do you agree that the Internet communication has had a positive impact on your interactions with students?**

Strongly agree  Agree  Neutral  Disagree  Strongly Disagree

**11. Self rating of level of internet skills**

Very high  High  Average  Low  Not stated

**12. Internet Attitude Scale (Scale Developed By Yixin Zhang)**

		Strongly Disagree	Disagree	Agree	Strongly Agree
1	Surfing on the Internet is not boring				
2	I can get more current information from the Internet rather than from printed material				
3	I do not feel nervous using the Internet				
4	I feel confident sending an E-mail message				
5	I like to use the internet to communicate with my friends				
6	The Internet provides convenient tools to communicate with others				
7	I feel comfortable talking about the Internet with others				
8	I feel confident using an Internet browser				
9	I enjoy searching for information on the Internet				
10	The Internet has become an indispensable tool in my daily life				
11	I feel at ease working on the Internet				
12	I feel confident discussing questions with others through the Internet				
13	Because I like using the Internet, I can stay on the Internet for a longer time				
14	Using the Internet could expedite my job				
15	I do not think that surfing the Internet is scary				
16	I feel confident forwarding an E-mail message				
17	I like working on the Internet				
18	It is easy to locate useful information on the Internet				
19	I have never been frustrated with the Internet				

20	I feel confident gathering useful websites				
21	I prefer to read information on the Internet than as a hard copy				
22	It is handy to use the Internet to obtain materials such as tax return forms and application forms, etc.				
23	The Internet does not threaten me				
24	I feel confident communicating with others through the Internet				
25	The interface of the Internet browser appeals to me				
26	Time spent on the Internet is worthwhile				
27	I do not feel anxious when I use the Internet				
28	I feel confident using WWW search engines				
29	Graphics and hyperlinks on the Internet attract my attention				
30	The Internet can help locate the information efficiently				
31	The Internet does not make me uncomfortable				
32	I feel confident using HTML (Hyper Text Markup Language) to create my home page				
33	Whenever I log onto the Internet, I would like to stay as long as I can				
34	The Internet is always my first choice for research				
35	The interface of the Internet browser does not make me uneasy				
36	I feel confident using an HTML editor (eg. Composer, Front Page, Dreamweaver, etc.)				
37	I prefer the internet to the library for research				
38	I feel that the Internet is useful to contact someone in a remote area				
39	I feel comfortable communicating with others on the Internet				
40	I feel confident locating the information I need on the Internet				

13. In which year you started using Internet?

14. How long have you been using the Internet?

- Less than 6 months                       6 months-1 year   
 1-2 years                                       2-4 years   
 More than 4 years                               Any other

15. How often do you use Internet services?

- Daily                                       2-3 times a week   
 2-3 times a month                               Once in a month

16. On average, how many hours you spend in a week to use Internet?

- Less than 1 hour a week                       2-4 hours a week   
 5-6 hours a week                               7-9 hours a week   
 10-20 hours a week                               Over 20 hours a week

17. From which place do you most frequently use the Internet and tick for the type of Internet connection if you know?

Place of work		Dial-Up	Broadband	Leased Line
At Work place				
At University Library				
At Department Library				
At Home				
At Other Place & Any Other Connection (Specify)				

**18. How did you acquire Internet skills?**

- 1. Trial and error method
- 2. Guidance from colleagues and friends
- 3. Training from University
- 4. Self Instruction
- 5. Online Instruction
- 6. By reading articles, books on the Internet
- 7. External courses
- 8. Multiple sources

**19. For what Information seeking activities do you use the Internet?**

Sl. No.	Activity	
1	Research/Education	
2	Publication Information	
3	Lecture Preparation Information	
4	Job Vacancies Information	
5	Seminar/Conference Information	
6	Library & Information Services	
7	Any Other(Specify)	

**20. For what Communication activities do you use the Internet?**

Sl. No.	Activity	
1	Subject Expert	
2	Overseas friends/colleagues	
3	Overseas Educational Institutions/ Research Organisations	
4	Students	
5	Local friend/Colleague	
6	Academic Supervisor	
7	Any Other(Specify)	

**21. What is the frequency of your Internet service usage?**

Frequency	E-mail	WWW	Newsgroups	Downloading Information	Recreation
More than once a day					
Once a day					
2-5 times/week					
Once a week					
2-5 times a month					
Once a month					
Other (specify)					

**22. How do you use the information obtained through the Internet?**

Sl. No.	Use of Information	Yes	No
1	For Research		
2	For Publication		
3	For Teaching		
4	For Guiding Research		
5	Personal Interest		
6	Other (Specify)		

23. How often do you use the Internet search engines and please indicate the preferences of using these services by 1,2,3.....etc.

Search Engine	Never used	Sometimes	Often	Preferences
Google				
Yahoo				
Alta Vista				
Lycos				
Excite				
Web Crawler				
Magellan				
Others (Specify)				

24. How do you browse the required information from the Internet?

Type the web address directly  Use Search Engines

Use subscription databases  Subject Gateways  Any other (Specify)

25. How has this Internet impacted on the teaching efficiency?

- Do you use the downloaded materials for classes beyond Text book? Yes  No
- Does the Internet & electronic sources such as an OPAC benefit your teaching & research process? Yes  No
- Has communication improved dramatically as a result of the Internet, both internally & externally? Yes  No
- Do you publish any academic material in an e-journal as a result of this medium? Yes  No
- Do you have any your own website? (referring the publications, activities of your self) Yes  No
- Do you recommend any web sites & text archives in a bibliography? Yes  No
- Are your departments endowed with suitable hardware & software to encourage active use of Internet? Yes  No
- Can modules be produced and offered in HTML format to provide a wider circulation of the lecture and handouts via a series of hypertext links? Yes  No
- Do you think the graphical, textual, hypertext, archival & remote based style replaces the traditional "chalk and talk" and the printed form of delivery? Yes  No
- Does the Internet allow connecting people with information more efficiently & effectively? Yes  No

26. Contribution of the Internet in Information & Communication Needs

Level of contribution	Contribution to Information need	Contribution to Communication need
Immeasurable		
A great deal		
A fair amount		
A little		

27. Is the information on Internet adequate for your needs?

Always  Some Time  Never

28. Your opinion has to what extent you rely on Internet services?

100%  75-99%  50-74%  25-49%  <25%

29. Desirability of Internet/computerized bibliographical database

Desirable  Required  Not required

30. Is Internet service available in your University Library? Yes  No

31. Is databases available in the University Library? Yes  No

32. Are you aware of the subject content of Electronic Journal that the University Library subscribes to:

I am not aware

I am aware of some of them

I am aware of many of them

33. Do you use electronic databases that the University Library provides in the library web pages?

Yes

No

34. If Yes,

Please rank in order of importance according to your reasons for using databases, (indicate by using 1 for first choice, 2 for second choice, etc.....)

Research activities

Teaching activities (Lecture preparation)

Publication activities

Information retrieval (Research and access to full text)

To be informed about electronic databases

35. If No,

Please rank your choices according to your reasons for not using databases ((indicate by using 1 for most important down to 5 for least important)

I don't know how to use electronic databases

I have no knowledge on digital technology

I don't have any interest

I don't find useful

I meet my information need from other sources

36. Do you think Internet can replace library services? Yes  No

If yes, please explain how?