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Changing Roles of LIS Professionals in Present Era

Tridib Tripathi*, Partha Sarathi Mandal**

ABSTRACT

This paper points out what is librarianship, what does a library and information professional do, the vision of LIS professionals, new challenges in the changing environment, causes of challenges and the ways to face the growing challenges. Some new roles and responsibilities of LIS professionals are also discussed here.

Key words: Challenges in the Changing environment; Information professionals; Librarianship; Library professionals; Vision of LIS Professionals in India

INTRODUCTION

Information is power. It is everywhere. It is growing very fast on the Internet. In this context librarian turns into information professional. The primary objective of information professionals is to organize and to provide access to information. In this context new LIS education should help to provide trained manpower, to manage different types of libraries, information and documentation centres. These are undergone changes in terms of needs, functions, types and range of services. The introduction of computers is a challenge to all librarians and information professionals. To meet these new challenges, librarian may have to function like collection developer, content manager, consortia manager, facilitator, web-site builder or publisher, interface designer, consultant, marketer, negotiator, team leader, Public relational officer, information Broker, information Analysts, Interpreter,

communicator, content provider and more like a teacher. Like a teacher, he can also train users to search and retrieve information.

What is librarianship

It is a challenging and dynamic career, which is concerned with information and the management. It includes the collection, organization and distribution of all kinds of materials and in different formats for education, information, cultural development and recreation. It is also the provision of specific information services to different communities and/or specialist groups. It offers an exciting diversity of career opportunities ranging from the applications of sophisticated computers and telecommunications to using traditional methods of research and the gathering of information to advance the social and economic development of society.

What does a library and information professional do

Within the library and information services, major functions are:

- Identification or Selection of information sources relevant to the needs of the user community.

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- Collection of information sources relevant to the needs of the user community.
- Organization and management of the information sources and facilities so that the collections are accessible to the users.
- Distribution of information to the users

Vision of LIS Professionals in India

The LIS professional in India, in the digitized environment, should have the following vision:

- To introduce IT and ICT applications and other important components such as appropriate operating systems(e.g. Linux), LAN services, RDBMS, data transfer, FTP, Telnet and house keeping software etc.
- To arrange regular orientation programmes for all LIS professionals
- To arrange networking of various libraries
- To use the open standards
- Practising e-education programmed and developing Virtual Learning Tools (VLT).
- Strengthening of research components to accept the new challenges: etc.

Cause of new challenges

The environment is changing very rapidly due to economic, social, demographic, political, educational and technological changes. The society becomes more paperless to information base or electronic base. Hence the profession of librarianship seems now to be approaching a crisis point. Other causes of new challenges are -

- Information explosion
- Increasing use of ITs and ICTs
- Competition from other organizations tools and services.
- Emphasizing on information as a commodity, and its competitive importance.

Challenges in the Changing environment

- Internship
- Training opportunity
- Sustainability
- Economy of the use of information
- Copyright infringements
- Para professionalism etc.

How to meet the Challenges

The role of librarians has changed in this changing environment. The librarian & information professionals are required to acquire such knowledge & skills as the library is now one of the highly IT influenced service profession. To meet the challenges, we require arranging the following things:

Resource sharing & Networking

The term 'resource' applies to any thing, person or action to which one turns for time of need. The modern concept of resource encompasses various activities like co-operative, acquisitioning, cataloguing, classification & development of professional's workers and the dissemination of information. It helps us in achieving maximum result with minimum input. Keisler says, "The social efforts of computer networks may be far greater and more important than you imagine," and modern technology will enable libraries to cooperate and create networks with speed and ease. Some of the important data networks are India's National Informatics Center's NICNET, INDONET and ERNET etc. The library networks are DELNET and INFLIBNET etc.

Software

The last few years have seen some important and useful initiatives in the development of library automation software. Some special libraries, notably at BHEL, SAIL, ICRISAT, NISCARE, DESIDOC – the Defense Scientific

Information and Documentation Centre, the Indian Institute of Technology, IIT Kanpur, have successfully developed software for library automation. Book and serial acquisitions, computer assisted cataloging, union listing, and current awareness services are some of the applications developed. LIBSYS and TULIPS among the better-known commercial packages that have been developed for both DOS and UNIX and are therefore available not only on microcomputers but also on minicomputers and mainframes and in LAN environments.

Developed knowledge and Skills

Librarian and information professional involved in information gathering, storage, retrieval and dissemination. For this Librarian needs to understand –

- Knowledge resources (books, journals, i.e. resources, Internet)
- Technological facilities and resources (computer, online catalogues, websites, LANs file servers etc.)
- Financial resources (Budget) Human resources (Skills for manpower training)

IT demands a range of skills from library and information science (LIS) professionals like excellent communication skills, managerial skills, operational skills and technological skills etc. Operational skill demands-

- Operating systems - Windows, UNIX, LINUX.
- Word processing, Graphics, Spreadsheet & Presentations.
- Database Management Systems including the skills in Bibliographic Database Management Systems.
- General purpose programming, Networking
- Web page Development and Content Management
- Information Retrieval software for online, CD-ROM and Internet.

- Library software packages, acquaintances with Digital Library Tools.

Librarians will need to join the training programs, which can be in the form of workshops, conferences, seminars, symposia, etc

Association

Associations are seen as ways of getting and sharing information. It is through association activities that librarians can enlarge their network of contacts ensuring that they get the most current and practical information. Through associations, librarians can also contribute to the profession's body of learning by publishing in association journals, newsletters, and monographs and by presenting programs at conferences and continuing education courses. For those looking for upward career movement; associations provide the opportunity to develop leadership skills by serving as leaders in committees, interest groups, divisions, and executive councils

New roles & responsibilities of LIS professionals

In the present technological /Internet era, the professionals have to change themselves as the information professionals. Now the information specialists have to work as an e-information resourcer who is expected to map strategies that lead to produce, manage, maintain and service the information. Information professionals have to work as:

Librarian

As librarians or library managers, they act as collection developer, technical processors and so on. As system network managers, they have to develop & design appropriate system.

Information Manager

To meet the information need of the users, they should know how to manage and deliver appropriate information services.

Information adviser/instructor

As information advisors/instructors, they should know how to access relevant sources of information (literacy).

Content Manager

As content managers, information professionals create, manage and publish on-line content without the need of any programming or technical skills. Content manager should possess the following qualities
1. professional ethics 2. resource building 3. knowledge organization 4. technological knowledge 5. knowledge accumulation: education & life long learning 6. knowledge dissemination service 7. knowledge inquiry research 8. institution management. etc.

Information Manager

As information managers, they should know how to manage and deliver appropriate information services etc.

CONCLUSION

A librarian must be talented and trained, skillful & flexible. An ideal librarian is one, who is competitive, assertive, cooperative, willing to compromise, intellectually committed, equipped with technical and managerial competencies, enthusiastic to the need of new technologies at the same time. Technology alone cannot help bring about the required changes so we need to change our attitudes, practices, and policies. To meet the new challenges we need theoretical realization and practical implementation.

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Use of Information Resources and Services in the Veterinary College Libraries of Karnataka

Bindu K*, Chandrappa S**

ABSTRACT

Information is the essential commodity for studying, teaching, research and extension activities. The present study makes an attempt to know the use of information resources and services by the teachers/scientists, research scholars and post graduate students in the veterinary colleges of Karnataka State. Questionnaire method was adopted to collect the data from the academic community along with observation and informal interviews. The study aimed at identifying the adequacy of library resources and services, purpose and frequency of using library resources. Tests like mean value and percentage method were adopted to verify the results. Further attempt was also made to highlight the findings of the study and suggestions given based on the analysis and interpretations of the study.

Key words: Information resources; Services; Veterinary education; Veterinary libraries.

INTRODUCTION

Library is a knowledge centre which has rich information resources stored in different ways. For getting information, the users may depend on printed or electronic forms of information. The primary purpose of the library resources is to support teaching, learning and research in ways consistent with and supportive of the institutions mission and goals. Adequate information resources and services offered will support the intellectual, cultural, and technical development of the academic community.

The veterinary college libraries play a vital role in education system. They act as an information resource centre that supplements study, teaching, research and extension activities of the parent institution. Veterinary science being a multidisciplinary subject, the library is expected to acquire, organize, store, retrieve and disseminate information not only on the specific subject, but also in current direction of technological advancement.

Unprecedented growth and diversification of information is a problem in veterinary and animal science also. The complexity in information explosion and globalization necessitates reorganizing and repackaging of the information according to the needs of veterinarians.

Veterinary Colleges in India

Veterinary Science is a science of diagnosing, treating and curing the diverse type of diseases in birds and animals. The subject broadly covers the study of animal physiology, treatment and prevention of diseases among animals.

Veterinary education is as old as human civilization and developed in India as early as Vedic Period. In order to train personnel in modern veterinary and animal husbandry practice, the first veterinary institute began in 1862 with the establishment of an Army Veterinary School at Poona. In due course of time the veterinary colleges at Lahore (1882), Mumbai (1884), Kolkata (1893), Patna (1930), Chennai (1932), Hyderabad (1946), and Mathura (1947) came up with the aim of imparting a sound and efficient system of veterinary education.

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First veterinary college in Karnataka was established in 1958. It was then affiliated to Mysore University and continued up to 1964. Later, in 1965 became a constituent college of University of Agricultural Sciences, Bangalore, to meet the increasing demand for veterinary graduates. Veterinary College, Bidar, was started in 1984, at Shimoga in 2005 and at Hassan in 2007. In 2005, after the establishment of Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU), the veterinary colleges have become a part of the KVAFSU. The main focus of these institutions is to make veterinary education responsive to the growing needs of the society in general and aspirations of the livestock farmers in particular. In this direction, it strives hard to produce highly skilled and competent manpower to meet the needs of the changing society and challenges of the new areas of research and extension.

The role of veterinary colleges is to enhance the livestock production, health improvement, milk production and strengthening the nation's wealth. All the existing veterinary and animal sciences institutions come under the purview of Indian Council of Agricultural Research (ICAR), New Delhi.

Scope and Limitations of the Study

The present study confirmed to the use of information resources and services. There are four veterinary colleges in Karnataka. Each of these institutes has libraries to cater to the needs of their academic community. Keeping in view the enormity of the study, the scope and limitations of the study covered only those

colleges offering Post Graduate and PhD courses.

OBJECTIVES

- To know the types of information resources used for study/teaching/research.
- To study the frequency and purpose of using information resources
- To assess the usefulness of services provided by the library.
- To assess the adequacy of information resources and services.

METHODOLOGY

The present study was conducted by collection of data through structured questionnaire and personal visit to these colleges. The questionnaire was administered using a simple random sampling technique. A total number of 160 questionnaires were administered among the users of the veterinary colleges under study of which 149 questionnaires were received back with response rate 93.12%. The sample respondents consisted of all together 77 faculty members (F.M), 30 research scholars (R.S) and 42 post graduate students (P.G). The data collected was tabulated and analyzed. Statistical techniques of mean value and percentage method were mainly used to analyze the collective data. Five point scale was adopted to get the mean and rank order.

Table 1: Veterinary Colleges of Karnataka: The State of the Art Report

Sl.No	Name of the college	Year of Establishment	Courses offered
1.	Veterinary College, Bangalore	1958	UG, PG, PhD
2.	Veterinary College, Bidar	1984	UG, PG, PhD
3.	Veterinary College, Shimoga	2005	UG
4.	Veterinary College, Hassan	2007	UG

Table 2: Frequency of Visit to the Library

Sl. No	Frequency	No. of Responses n=149	Percentage
1	Daily	91	61.07
2	Twice in a week	38	25.5
3	Fortnightly	12	8.05
4	Once in a month	6	4.03
5	Occasionally	2	1.34

DATA ANALYSIS AND DISCUSSION*Frequency of visit to the library*

The use of library could be measured by several ways. One such way is the frequency of the visits of users to the library.

It is evident from Table 2 that majority of the users visited the library daily (61.07), 25.5% of the users visited the library twice a week, 8.05% of users visited the library fortnightly, and 4.03% of users visited the library once in a month, and very few visited the library occasionally.

Purpose of visit to the library

A user visits the library for many purposes like reading, research, recreation etc. The main

purpose of using a library was to explore the professional purpose of the veterinarians.

It is evident from the Table 3 that majority of respondents used library resources for subject information (90.60%), 74.50% for ongoing research work and 71.81% for the purpose of thesis/project work. Also, 65.10% of the respondents used them for writing research papers for publication and 46.98% for preparation of teaching /lecture notes. Around 48.32% for guiding researchers/PG students and 28.86% for exploring research grants. About 17.45% of the respondents used information resources for curriculum design. Thus, it may be inferred from the above facts that there is a significant use of library resources for research purposes.

Table 3: Purpose of Visit to the Library

Sl. No.	Purpose	Teachers/ Scientists(n= 77)	Research Scholars(n=30)	P.G Students (n=42)	Total (n=149)
1	Ongoing research work	47 (61.04)	30 (100)	34 (80.95)	111 (74.50)
2	Preparation of teaching/lecture notes	60 (77.92)	8 (26.67)	2 (4.76)	70 (46.98)
3	Thesis /Project work	42 (54.54)	30 (100)	35 (83.33)	107 (71.81)
4	Writing research papers	62 (80.52)	30 (100)	5 (11.9)	97 (65.10)
5	Subject information	65 (84.41)	30 (100)	40 (95.24)	135 (90.60)
6	For guiding researchers/P.G students	54 (70.13)	14 (46.67)	4 (9.52)	72 (48.32)
7	Exploring research grants	18 (23.37)	13 (43.33)	12 (28.57)	43 (28.86)
8	curriculum design	24 (31.17)	2 (6.67)	Nil	26 (17.45)

Table 4: Types of Information Resources and their Usefulness

Sl. No.	Types of Resources	Usefulness of Information Resources(n=149)						
		1	2	3	4	5	Mean	Rank
1	CD-ROM s	2	7	22	31	87	4.3	1
2	Current Journals	-	4	24	53	68	4.24	2
3	On-line databases	-	13	27	35	74	4.14	3
4	Reference books	-	8	23	62	56	4.11	4
5	Books	-	14	26	57	52	3.99	5
6	Reports	3	19	28	55	44	3.79	6
7	On-line journals	8	12	38	49	42	3.7	7
8	Back Volumes	5	22	37	47	38	3.61	8
9	Thesis	16	24	41	40	28	3.27	9
10	Conference proceedings	12	46	53	26	12	2.86	10
11	Standards	18	36	54	26	15	2.83	11

(1=Not at all useful, 2= Somewhat useful, 3= Moderately useful, 4=Useful, 5=Most useful)

Table 5: Usefulness of Library Services

Sl. No.	Library Services	Usefulness of Library services (n=149)						
		1	2	3	4	5	Mean	Rank
1	Circulation service	0	0	12	51	86	4.5	1
2	Web based services	0	7	18	46	78	4.3	2
3	Photo copying service (Xerox)	0	6	23	44	76	4.27	3
4	Reference services	4	24	18	38	65	3.91	4
5	User Education/Orientation	14	25	34	37	45	3.62	5
6	Current Awareness Service	9	38	26	34	42	3.42	6
7	Interlibrary loan Service	12	47	38	30	22	3.02	7
8	Referral services	12	34	22	45	16	2.72	8
9	News paper clipping service	16	52	33	22	13	2.5	9

(1=Not at all useful, 2= Somewhat useful, 3= Moderately useful, 4=Useful, 5=Most Useful)

Usefulness of Information Resources

Library is a physical place where collection of information resources in various types and formats is organized with the services required

To know the usefulness of library resources opinions of users of both the colleges were considered. Table 4 shows that in serial ranking order, CD-Rom databases are most useful and ranked first with a mean value 4.3, followed by current journals with mean value 4.24, on-line data bases with mean value 4.14, reference books with mean value 4.11, books with mean value 3.99, reports with mean value 3.79, on-line journals with mean value 3.7, back volumes of journals with mean value 3.61, thesis with mean value 3.27 conference proceedings with mean value 2.86 and standards with mean value 2.83. It is evident from the above table that users of veterinary college libraries use both print and electronic resources. CD-ROM databases are most sought after information resource and current journals and on-line databases are in next priority.

Usefulness of Library Services

Library is a service oriented institution and provides services to its clientele. Library services are varying from library to library but in the veterinary college libraries under study provide same services to their users.

Table 5 shows that circulation service is most useful with mean value 4.5 and first in the rank order, web-based services occupies second position in rank order with mean value 4.3, photo copy service third in the rank position with mean value 4.27, reference service is fourth with mean value 3.91, orientation/user education is fifth with mean value 3.62, current awareness service is sixth with mean value 3.42, inter-library loan is seventh with mean value 3.02, referral service is eighth with mean value 2.72 and news paper clipping service is ninth with mean value 2.5. It is evident from the above table that circulation service is the most useful service of the veterinary college libraries.

Adequacies of Information Resources and Services

To ascertain the various demands of the users, it is essential to consider that the

Table 6: Adequacies of Information Resources and Services

Sl. No.	Resources and Services	Adequacies of Information Resources and Services (n=149)						
		1	2	3	4	5	Mean	Rank
1	Books, Journals, Reports etc.	0	5	18	42	84	4.37	1
2	Electronic Resources	0	4	30	46	69	4.21	2
3	Assistance/Co-operation of library staff	0	7	46	41	55	3.97	3
4	Library services	0	17	39	46	47	3.83	4

[1=Very poor, 2= Poor, 3=Moderately good, 4=Good, 5=Very good]

information resources and services provided are adequate to meet the information requirements of its users.

Table 6 shows that users of veterinary college, Bangalore, and Bidar, ranked print resources like books, journals, reports 1st and

electronic resources 2nd. Users of both the colleges ranked assistance/ co-operation of library staff 3rd with mean value 3.97 and library services 4th with mean value 3.83. It is evident from the above table that, Veterinary College Libraries of Karnataka has very good

collection of information resources. It shows that users are satisfied with library resources (both print and electronic resources).

Findings

The major findings of the study were:

1. Most of the users visit the library for their information need.
2. CD-ROM databases and current journals are most preferred sources of information for their study, teaching and research work.
3. Circulation service and web-based services are most used services, and it is noticed that many of the users are not aware of important services like inter-library loan service, current awareness services etc.
4. Both the libraries have not initiated digitalization of old and rare collection.
5. Regular user survey is not organized in these libraries to know the status of the library services.

Suggestions

Based on the findings of the study, the following suggestions are put forward to improve the use of information resource among teachers/scientists, research scholars and post graduate students in the veterinary colleges of Karnataka.

1. More number of current journals and CDs should be procured in all the disciplines and preference should also be given for on-line journals.
2. Significant numbers of users are aware of the existence of print and electronic information resources. The study recommends organizing orientation training very often to make use of the information resources available in the library.
3. A good number of users have stated that library staff is co-operative and they should assist in searching the required information. It is suggested to increase the number of staff,

and training must be given to existing staff in current developments.

4. It is suggested to start current awareness services like e-mail services and bulletin board services to inform the users about the new arrival of on-line journals, books, CD-ROM and other information resources.

5. Efforts have to be made in complete automation and networking of veterinary college libraries and to form consortia for providing information sources and services.

6. More funds to be allotted to acquire print and e-resources.

CONCLUSION

Users of Veterinary colleges use various types of information resources for their study, teaching, research and extension work. Usefulness and preferences of information resources and services is varied, depending on the category of the user, nature of information needed and its accessibility. The study shows that CD-ROM databases and on-line databases are most used electronic resources and current journals and reference books are most used print resources. Veterinary college libraries which serve the academic community need to understand their information need in the ICT (Information and Communication Technology) environment and provide best resources and services to satisfy their users.

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Assessing Quality of Library Services: A Case Study of Select Libraries of Northern India

Vinod Kumar*, H. Bansal**

ABSTRACT

Since their inception, the university libraries are engaged with the task to select, acquire, process, store, retrieve and disseminate the documents/ information to cater to the informational needs of their users- the faculty, students, research scholars, and administrative staff of the universities. It is a challenge for the university libraries to filter and deliver the most useful information from the vast quantity available anywhere. For this purpose, library professionals need to manage the resources of the libraries- man, money, machine, materials using various methods and techniques, in order to provide quality library services to their users. To manage the resources, librarians are now applying management practices and information communication technologies. The present paper describes need for accessing library services and SERVQUAL as a tool to assess the quality of library services after certain modifications. The result of study may motivate the library authorities to get the feedback from the library patrons in order to enhance the quality of such services which require immediate attention.

Key words: University library; SERVQUAL; Service quality.

INTRODUCTION

Barua¹ defined a library as “an organized collection of books and other reading and audio-visual materials, and the services of a staff able to provide and interpret such materials as are required to meet the informational, research, educational or recreational needs of its users. A library is often classified and designated from the point of view of needs or objectives and the category of readers intended to be served. Whatever may be the types of libraries, collection, organization and dissemination are the primary purposes and functions of all libraries”.

The service is a complicated phenomenon. Different people define service differently from 1960s to 1980s. These definitions focus upon

the service activity, and mainly include only those services rendered by so-called service firms. Gronroos² defined service “as a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and / or physical resources or goods and / or systems of the service provider, which are provided as solutions to customer problems”. By 1990s the importance of use of the Information Technology to provide services had increased dramatically. The most important contribution to market theory and practice by service research, especially emphasized by the Nordic School, is the notion of interaction instead of exchange as a focal phenomenon.

Measurement or Assessment of Library Service Quality

The commitment of the Association of Research Libraries (ARL) was strengthened in 1994 when ARL adopted as a strategic objective “to describe and measure the performance of research libraries and their contribution to teaching, research,

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scholarship, and community service." By this action, the Association of Research Libraries demonstrated the previously stated desire of the major research libraries "to maintain the useful approaches of the past and explore responses to the challenges of the present and future" (Pritchard)³.

Measuring library service quality should be a continuous process to assess the areas which need immediate and urgent attention to enhance the quality of the services and to make the user more satisfied. A satisfied user may or may not advertise the facts about the good library services but an unsatisfied user damages the image of the library. Library service quality assessment may be undertaken as a project. Library service quality is a concept that is becoming less elusive and increasingly recognizable and actionable. Understanding library quality will possibly lead us to developing not only an understanding of preferred and best service practices but towards widespread recognition of standards for library quality, especially to the extent that users have an overarching preconceived notion of the library quality.

Academic libraries must improve the quality of their services in order to survive to make the users satisfied with library services. Most of the traditional statistics gathered by libraries lack relevance and do not measure the library's performance in terms of element important to customers. They do not really describe performance or indicate whether service quality is good, indifferent, or bad. Even worse, they do not indicate any action that the administration or any team could or should take to improve performance. (Hernon and Altman)⁴

Hernon et al. 1999⁵ stated that the research on service quality reported in the Library and Information Research (LIS) concentrates on one dimension-expectation- and defines service quality in terms of reducing the gap between the services provided (perceived or real) and customer expectation. Implicit in the definitions is that the organization will try to narrow the gap. For libraries, service quality

applies to three general areas, each of which consists of assorted variables:

Resources: information content

Organization: service environment and resource delivery

Service delivered by staff

SERVQUAL: A Measuring Rod of Service Quality

In the early 1980s, the impetus to measure and evaluate service quality arose from the marketing discipline. A repeated theme in the marketing literature is that service quality, as perceived by consumers, is a function of what customers expect and how well the firm performs in providing the service. Recognizing the centrality of customer perception of service quality, academicians sought to devise methods to assess customer views of quality service empirically (Cook and Thompson)⁶. Among the most popular assessments tools of service quality is SERVQUAL, an instrument designed by the marketing research team of Parasuraman, Berry and Zeithaml⁷. Through numerous qualitative studies, they evolved a set of five dimensions which have been consistently ranked by customers to be most important for service quality, regardless of service industry. These dimensions are defined as follows:

Tangibles

Appearance of physical facilities, equipment, personnel, and communication materials;

Reliability

Ability to perform the promised service dependably and accurately;

Responsiveness

Willingness to help customers and provide prompt service;

Assurance

Knowledge and courtesy of employees and their ability to convey trust and confidence; and

Empathy

The caring, individualized attention the firm provides to its customers.

The three collaborators concluded that quality could be viewed as the gap between perceived service and expected service, and their work eventually resulted in the Gap Theory of Service Quality, that is,

$$Q = P - E$$

(Where Q = Quality, P and E are Customers' Perception and Expectation of particular product/service)

Parasuraman, Berry and Zeithaml identified following five quality gaps:-

Gap 1

Difference between actual user expectation and management's idea or perception of user expectation;

Gap 2

Mismatch between manager's expectation of service quality and service quality specifications;

Gap 3

Gap between the service quality specifications and the delivery of service;

Gap 4

Differences between service delivery and external communication with the users;

Gap 5

Difference between Expected and Perceived Quality

SERVQUAL, developed by Parasuraman et al.⁸, has now evolved as an effective instrument to measure library service quality. It has been used in various library settings, including university, public, and special libraries around the world (see, for example, Martin⁹, Nagata et al.¹⁰, Satoh et al.¹¹, Sahu¹², Green¹³, Kumar¹⁴).

OBJECTIVES

The following specific objectives have been identified:

To identify the gap between the levels of perception and expectation of library users towards library services;

To study whether users, across different types of libraries, exhibit different levels of satisfaction in respect of library services;

To recommend specific suggestions which can help the libraries in enhancing the quality of library services.

Data Collection

A structured questionnaire was developed by modifying and extending SERVQUAL tool to collect data from the library users. At least one university from all eight States and one Union Territory of Northern India was included in the study.

Total twelve universities were selected and divided in three types of universities namely science & technology universities, agricultural universities and general universities. From each type, the researcher selected four universities in such a way that at least one library from all eight States and one Union Territory of the Northern India was included in the sample. A sample of 1200 library users (100 users per library) was taken from these twelve universities. The details with regard to twelve selected libraries of three types of universities are shown in Table 1.

Table 1: List of University Libraries Included in the Study

Sr. No.	Type	Name of the University	Name of the Library	State/ UT	Abbrn.
	Science & Technology	Guru Jambheshwar University of Science and Technology, Hisar	University Library	Haryana	GJUST
	Science & Technology	Deenbandhu Chhotu Ram University of Science and Technology, Murthal	University Library	Haryana	DCRUST
	Science & Technology	Guru Gobind Singh Indraprastha University, New Delhi	Information Resource Centre	Delhi	IPU
	Science & Technology	*Uttar Pradesh Technical University, Lucknow	Library	Uttar Pradesh	UPTU
	Agricultural Sciences	Chaudhary Charan Singh Haryana Agricultural University, Hisar	Nehru Library	Haryana	HAU
	Agricultural Sciences	Gobind Balabh Pant University of Agricultural, Pant Nagar	University Library	Uttarakhand	GBPUA
	Agricultural Sciences	Punjab Agricultural University, Ludhiana	University Library	Punjab	PAU
	Agricultural Sciences	Y. S. Parmar University of Horticulture & Forest, Solan	Satyanad Store Library	Himachal Pradesh	YSPUA
	General	Kurukshetra University, Kurukshetra	Jawaharlal Nehru Library	Haryana	KUK
	General	Panjab University, Chandigarh	University Library	Chandigarh	PUC
	General	University of Jammu, Jammu	Central Library	Jammu & Kashmir	UoJ
	General	University of Rajasthan, Jaipur	Central Library	Rajasthan	UoRJ

*Now known as Gautam Buddh Technical University, Lucknow

Analysis of Data

To find the gap between the perception and expectation of users towards quality of library services, data was analyzed on the basis of lowest average gap scores. To find the significant difference in the gap scores across the type of libraries, 'F' test was used.

Library Services

Library services mean the facilities and services provided by a library to achieve the organizational objectives. The library is considered as the hub of academic activities in a university. Table 2 shows that the maximum and minimum average expectation

scores, i.e. 4.408 and 4.300 were observed in agricultural universities and science & technology universities, respectively, against the total average expectation score of 4.355. The maximum and minimum average perception scores, i.e. 3.459 and 3.146 were observed in general universities and agricultural universities, respectively, against the total average perception score of 3.348. The minimum and maximum average gap scores observed were -0.898 and -1.154 in agricultural universities and science & technology universities, respectively, against the total average gap score of -1.007. The dimension 'Library Services' has a significant average gap

scores in all the statements as the gap ranges from -0.646 to -1.288.

The result of 'F' test shows that significant difference exists in two statements of library services with regard to the average gap scores observed across types of universities. The statements in which significant difference in the gap scores was observed are 'library provides very good photocopy service (value of 'F' test is 46.018)' and 'library helps in preparing bibliographies (value of F test was 8.339)'.

Library issues sufficient number of books on loan

Lending of library books on loan is one of the most important services of a university library. The highest and lowest average expectation scores of 4.364 and 4.354 were observed in science & technology universities and general universities respectively against the average expectation score of 4.358. The highest average perception score of 3.707 was observed in general universities and lowest perception score of 3.668 was observed in both types of universities i.e. agricultural universities and science & technology universities against the total average perception score of 3.681. The lowest and highest average gap scores of -0.646 and -0.696 were observed in general universities and science & technology universities respectively against the total average gap score of -0.677. Thus, the users of general universities were more satisfied with the issuance of number of books as compared to other types of universities. This statement is ranked at number 2. The significance level of 'F' test (0.875) shows that there was no significant difference across the average gap scores observed in three types of universities.

Library issues books for sufficient time period

The second statement discusses about the number of days that a member can retain a book. The users in all type of libraries were more satisfied with this statement as compared to other nine statements and placed

it at number 1. The highest and lowest average expectation scores of 4.521 and 4.482 were observed in agricultural universities and general universities, respectively, against the average expectation score of 4.505. The highest and lowest average perception scores of 3.893 and 3.836 were observed in agricultural universities and science & technology universities, respectively, against the average perception score of 3.858. The lowest (-0.629) and highest (-0.675) average gap scores were observed in agricultural universities and science & technology universities, respectively, against the total average gap score of -0.646. The significance level of 'F' test (0.885) shows that there was no significant difference in the average gap scores observed across the type of universities.

Library provides very good photocopy service

Research in the university requires consultation of a number of books and journals. Library provides photocopy service to make users' work easy. Library may provide this facility through private vendors or out of its own resources. The highest and lowest average expectation scores of 4.529 and 4.352 were observed in agricultural universities and general universities, respectively, against the average expectation score of 4.420. The highest and lowest average perception score of 3.899 and 2.721 were observed in agricultural universities and science & technology universities, respectively, against the total average perception score of 3.412. The lowest and highest average gap scores of -0.629 and -1.657 were observed in agricultural universities and science & technology universities, respectively, against the total average gap score of -1.008. Thus the users of science & technology universities are deeply dissatisfied with the photocopy service. This statement is positioned at number 4 within the dimension. The significance level of 'F' test (0.000) shows the most significant difference across the types of universities average gap scores.

Table 2: Average Gap Score Across Type of Universities: Library Services

Library Services	Sc. & Universities			Tech. Universities			Agricultural Universities			General Universities			Average		'F' Test	Sgnt	Rank
	Pern	Expn	Gap	Pern	Expn	Gap	Pern	Expn	Gap	Pern	Expn	Gap	Pern	Expn			
Statements																	
1 Library issues sufficient numbers of books on loan	3.668	4.364	-0.696	3.668	4.357	-0.689	3.707	4.354	-0.646	3.681	4.358	-0.677			0.134	0.875	2
2 Library issues books for sufficient time period	3.836	4.511	-0.675	3.893	4.521	-0.629	3.846	4.482	-0.636	3.858	4.505	-0.646			0.122	0.885	1
3 Library provides very good photocopy service	2.721	4.379	-1.657	3.899	4.529	-0.629	3.614	4.352	-0.738	3.412	4.420	-1.008			46.018	0.000	4
4 Library conducts user education/ library orientation programme	3.246	4.364	-1.118	3.346	4.414	-1.068				3.361	4.400	-1.039			0.191	0.827	6
5 Library transactions (Issue/ re-issue/ return) are made within 5 minutes	3.604	4.354	-0.750	3.811	4.479	-0.668				3.761	4.400	-0.639			0.622	0.537	3
6 Library provides free Internet facility	3.218	4.364	-1.146	3.386	4.571	-1.186				3.557	4.425	-0.868			3.421	0.033	5
7 Library has locker facility for keeping personal belongings	2.964	4.282	-1.318	2.961	4.379	-1.418				3.154	4.268	-1.114			2.562	0.078	9
8 Library provides Inter Library Loan service on demand	2.893	4.189	-1.296	2.979	4.168	-1.189				3.146	4.196	-1.050			1.832	0.161	8
9 Library has separate study rooms for research scholars	2.746	4.036	-1.289	3.221	4.350	-1.129				3.332	4.386	-1.054			1.667	0.189	7
10 Library helps in preparing bibliographies.	2.561	4.154	-1.593	3.229	4.307	-1.079				3.114	4.307	-1.193			8.339	0.000	10
Total Average	3.146	4.300	-1.154	3.439	4.408	-0.968	3.459	4.357	-0.898	3.348	4.355	-1.007					

Library conducts user education/ library orientation programme

Extracting or retrieving information/ documents out of the library requires certain skills. The library organizes library orientation programmes, in the beginning of the session or as a special drive to train research scholars. The programmes are very effective in utilizing the resources and making the user self dependent in retrieving and evaluating the documents. The highest and lowest average expectation scores of 4.414 and 4.364 were observed in agricultural universities and science & technology universities, respectively, against the average expectation score of 4.393. The highest and lowest average perception scores of 3.361 and 3.246 were observed in general universities and science & technology universities, respectively against the total average perception score of 3.318. The lowest and highest average gap scores of -1.039 and -1.118 were observed in agricultural universities and science & technology universities, respectively, against the total average gap score of -1.075. Thus the users in all the universities were dissatisfied with the library orientation programmes. This is evident from the fact that the average gap score across the universities exceeds -1. This statement is ranked at number 6 out of the total 10 statements. The result of 'F' test shows that there is no significant difference in the average gap scores observed across the type of universities.

Library transactions (Issue/re-issue/return) are made within 5 minutes

In addition to reading and consulting the library resources, users come in the library to issue/ re-issue and return the library documents. They expect from the library to make these transactions within 4 to 5 minutes. Delayed transactions make the users dissatisfied and they may avoid library visits. This statement relates to the question- are library transactions made within five minutes? The highest and lowest average expectation scores of 4.479 and 4.354 were observed in agricultural universities and

science & technology universities respectively against the average expectation score of 4.411. The highest and lowest average perception scores of 3.811 and 3.604 were observed in agricultural universities and science & technology universities, respectively, against the total average perception score of 3.725. The lowest and highest average gap scores of -0.639 and -0.750 were observed in general universities and agricultural universities, respectively, against the total average gap score of -0.686. This statement is ranked at number 3 out of the total 10 statements. The result of 'F' test shows that there is no significant difference in the average gap scores observed across the type of universities.

Library provides free Internet facility

In the present era, thinking about academic research without Internet is not possible. Emergence of electronic books and journals has made the academic community more dependent on Internet. Almost all the academic communication with editors, authors, co-authors, publishers, and conference / seminar / workshop organizers are now based on Internet. By providing Internet facility, university libraries are bridging the digital divide among the university patrons. The libraries provide access, content and training and help users who don't have the computer systems with Internet connectivity. These ULIC are also helpful to those users who have Internet facilities at home however, libraries provide Internet Protocol (IP) based access of electronic journals and books within the university premises. Thus, the users residing outside the university campus can't avail this facility. Today Internet has become a necessity and the users become dissatisfied with libraries if they do not get the smooth, fast and un-interrupted access.

This statement concerns the free Internet facility in the university. The highest and lowest average expectation scores of 4.571 and 4.364 were observed in agricultural universities and science & technology universities, respectively, against the average expectation score of 4.454. The highest and

lowest average perception scores of 3.386 and 3.218 were observed in agricultural universities and science & technology universities, respectively, against the total average perception score of 3.387. The lowest and highest average gap scores of -0.868 and -1.186 were observed in general universities and agricultural universities, respectively, against the total average gap score of -1.067. Thus, users in agricultural universities followed by science & technology universities were found most dissatisfied with Internet facility. This statement is ranked at number 5. The result of 'F' test shows that there is no significant difference in the average gap scores observed across the types of universities.

Library has locker facility for keeping personal belongings

Generally, library users are not allowed to take their belongings inside the library because allowing them to take their bags, personal books, books of other libraries, etc. create pressure for thorough checking at the gate. Therefore, users need to put their personal belongings at the gate. To keep these belongings safe, libraries have to provide locker facility at the gate. Users can keep their belongings in the locker and while going back from library, they return the locker's key to the library gatekeeper. The 7th statement discusses the availability of lockers in the university libraries. The highest and lowest average expectation scores of 4.379 and 4.268 were observed in agricultural universities and general universities, respectively, against the average expectation score of 4.310. The highest and lowest average perception scores of 3.154 and 2.961 were observed in general universities and agricultural universities, respectively, against the total average perception score of 3.026. The lowest and highest average gap scores of -1.114 and -1.418 were observed in general universities and agricultural universities respectively against the total average gap score of -1.283. This statement is ranked at number 9. The result of 'F' test shows that there is no significant difference in the

average gap scores observed across the types of universities.

Library provides Inter -library-loan service

Inter-library loan is a service wherein a user of one library can borrow books that are owned by another library. The user makes a request to library which in turn arranges the required material from another library. In this way the users can get even those documents which are not available in that library. The 8th statement discusses the issue of Inter -library -loan facility. The highest and lowest average expectation scores of 4.196 and 4.168 were observed in general universities and agricultural universities, respectively, against the average expectation score of 4.185. The highest and lowest average perception score of 3.146 and 2.893 were observed in general universities and science & technology universities, respectively, against the total average perception score of 3.006. The lowest and highest average gap scores of -1.050 and -1.296 were observed in general universities and science & technology universities, respectively, against the total average gap score of -1.179. This statement is ranked at number 8. It is observed that in all the three types of universities, the users are almost dissatisfied with this service of ILL. The result of 'F' test shows that there is no significant difference in the average gap scores observed across the types of universities.

Library has separate study rooms for research scholars

The research scholars have to consult many books related to their research but it is not possible to consult them all in a day or two. Library provides separate rooms to the research scholars for their studies. The highest and lowest average expectation scores of 4.386 and 4.036 were observed in general universities and science & technology universities, respectively, against the average expectation score of 4.257. The highest and lowest average perception score of 3.332 and 2.746 were observed in general universities and science

& technology universities, respectively, against the total average perception score of 3.100. The lowest and highest average gap scores of -1.054 and -1.289 were observed in general universities and science & technology universities, respectively, against the total average gap score of -1.157. This statement is ranked at number 7 within this dimension. The result of 'F' test shows that there is no significant difference in the average gap scores observed across the types of universities.

Library helps in preparing bibliographies

Preparation of bibliography on a research work, project work, assignment etc. requires certain skills and is a very cumbersome, tedious and time consuming job. With the emergence of computerized library services, libraries now can help the research scholars in preparing the bibliography. The 10th statement is that

'library helps in preparing bibliographies'. The highest average expectation score of 4.307 was observed in two types of universities i.e. general universities and agricultural universities. The lowest average expectation score of 4.154 was observed in science & technology universities against the average expectation score of 4.256. The highest and lowest average perception score of 3.229 and 2.561 were observed in agricultural universities and science & technology universities, respectively, against the total average perception score of 2.968. The lowest and highest average gap scores of -1.079 and -1.593 were observed in agricultural universities and science & technology universities, respectively, against the total average gap score of -1.157. This statement is ranked the last in all the ten statements as it has the highest total average gap score of -1.288. The result of 'F' test shows that there is

Chart 1: Average Gap Score : Science & Technology Universities

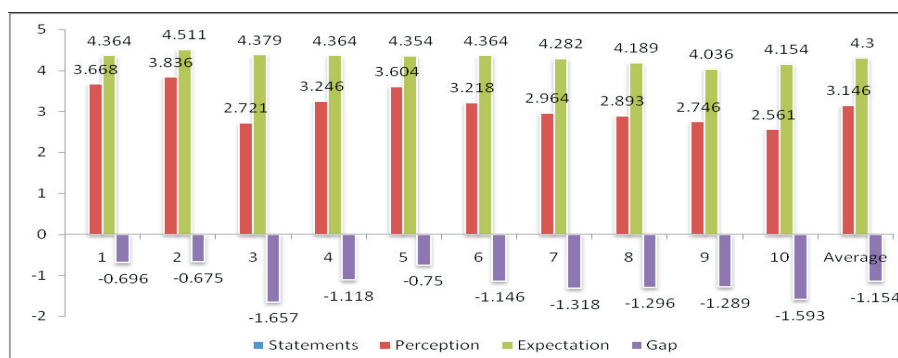


Chart 2: Average Gap Score : Agricultural Universities

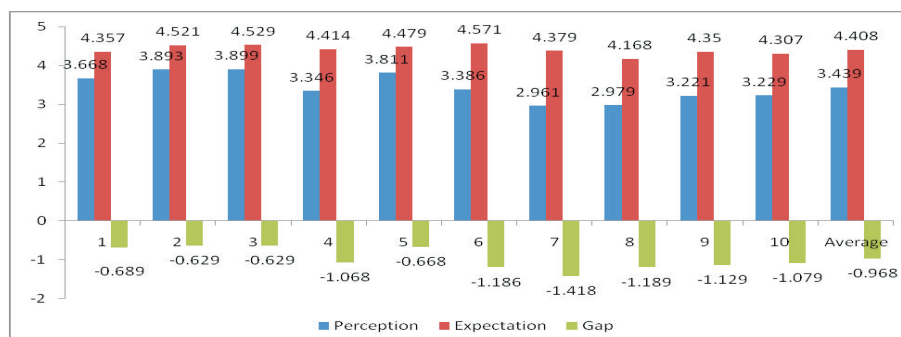
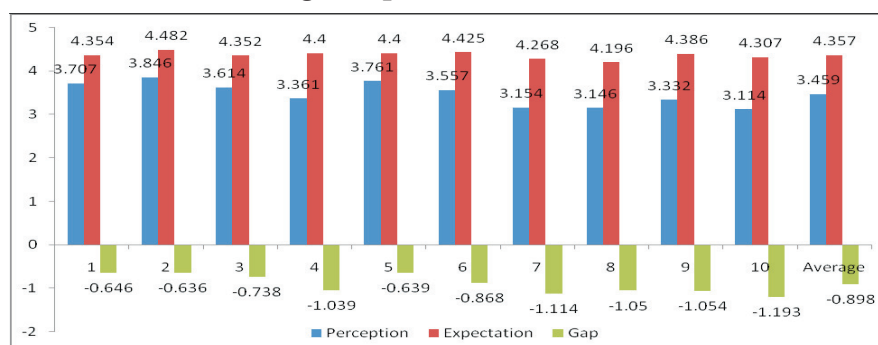
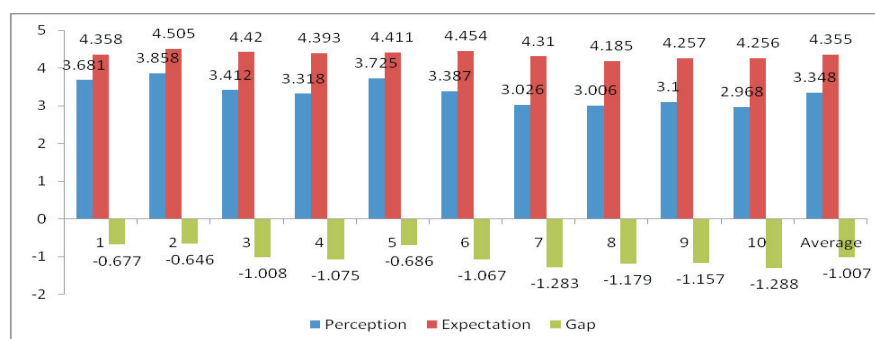


Chart 3: Average Gap Score : General Universities**Chart 4: Average Gap Score of all types of Universities**

significant difference in the average gap scores observed across the types of universities.

The lowest average gap scores for all the 10 statements except of 1st and 6th were observed in HAU, Hisar. The lowest average gap scores for 1st and 6th statements were observed in DCRUST, Murthal and KUK. The highest average gap scores for all statements (except 4th, 7th and 8th) were observed in UPTU, Lucknow. The highest average gap scores for 4th and 8th statements were observed in DCRUST, Murthal. The highest average gap score in 7th statement was observed in two Universities i.e. UPTU and DCRUST.

Across the types of universities, general universities got the first position with lowest average gap score of -0.898, agricultural universities came 2nd with gap score of -0.968 and science & technology universities last with the average gap score of -1.154 against the total average gap score of -1.007.

The statement-wise average perception, expectation and gap scores, observed in science & technology universities have been shown in Chart 1. The highest expectation and

perception scores and lowest average gap scores are observed in statement 2 (Library issues books for sufficient time period). Lowest expectation is observed in the 8th statement whereas the lowest perception and highest gap score is observed in the 3rd statement. The main reason for the poor library services observed in the science & technology universities is that two universities of this category i.e. DCRUST, Murthal and UPTU, Lucknow, are in their infant stage and their libraries don't have even their own buildings. Otherwise, it is observed that the GJUST, Hisar, has not only obtained 1st position in science & technology universities but also 3rd position among all the twelve universities.

The statement-wise average perception, expectation and gap scores, observed in agricultural universities have been shown in Chart 2. The highest expectation score is observed in 6th statement, highest perception score in 3rd statement and lowest average gap score is observed in 2nd and 3rd statement. Lowest expectation is observed in the 7th statement whereas the lowest perception and highest gap score is observed in 8th statement.

Table 3: University-wise Average Gap Score

	Sc. & Tech Universities						Agricultural Universities						General Universities							
	GJUST	DCRUST	IPU	UPTU	HAU	GBPUA	PAU	YSPUA	KUK	PUC	UoJ	UoRJ	Average	Rank						
Statements	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Gap						
1	0.671	-0.343	-0.729	-1.043	-0.357	-0.729	-0.857	-0.814	-0.514	-0.429	-0.729	-0.914	-0.566	1						
2	-0.571	-0.457	-0.629	-1.043	-0.357	-0.529	-0.686	-0.943	-0.686	-0.443	-0.686	-0.729	-0.647	2						
3	-0.786	-2.257	-1.129	-2.457	-0.157	-0.671	-0.771	-0.918	-0.429	-0.706	-0.957	-0.86	-1.008	4						
4	-1.1	-1.686	-0.671	-1.014	-0.8	-0.986	-1.171	-1.314	-0.829	-1.243	-1	-1.086	-1.075	6						
5	-0.914	-0.357	-0.557	-1.171	-0.3	-0.871	-0.929	-0.571	-0.514	-0.729	-0.514	-0.8	-0.686	3						
6	-0.386	-0.529	-0.786	-2.886	-0.371	-0.914	-1.4	-2.057	-0.343	-0.886	-1.229	-1.014	-1.067	5						
7	-0.886	-1.343	-1.7	-1.343	-0.671	-1.4	-1.671	-1.929	-1.057	-1.557	-1.014	-0.829	-1.283	9						
8	-0.814	-1.857	-1.2	-1.314	-0.514	-1.114	-1.357	-1.771	-0.629	-1.171	-1.314	-1.086	-1.178	8						
9	-1.029	-0.786	-1.214	-2.129	-0.429	-1.2	-1.229	-1.657	-0.571	-1.071	-1.4	-1.171	-1.157	7						
10	-0.914	-1.757	-1.129	-2.571	-0.457	-0.8	-1.586	-1.471	-0.829	-1.243	-1.529	-1.171	-1.288	10						
Average	-0.807	-1.137	-0.974	-1.697	-0.441	-0.921	-1.166	-1.345	-0.64	-0.948	-1.037	-0.966	-1.007							
Rank	3	9	7	12	1	4	10	11	2	5	8	6								

The statement-wise average perception, expectation and gap scores observed in general universities have been shown Chart 3. The highest expectation, perception and lowest average gap scores are observed in 2nd statement whereas the lowest expectation score is observed in 8th statement and lowest perception and highest gap scores are observed in 10th statement.

The statement-wise average perception, expectation and gap scores observed in all universities (Mean score) have been shown in Chart 4. The highest expectation, perception and lowest average gap scores are observed in 2nd statement whereas the lowest expectation score is observed in 8th statement and lowest perception and highest gap scores are observed in 10th statement.

The ranking of universities is also shown in the Table 3 as per lowest gap score. The HAU, KUK, and GJUST have occupied 1st, 2nd and 3rd positions respectively. UPTU, YSPUA and PAU are placed at the end i.e. 12th, 11th and 10th positions respectively.

Across the science & technology universities, GJUST (-0.807) has the lowest average gap followed by IPU (-0.974), DCRUST (-1.137). The UPTU has the highest average gap (-1.697) across these universities. The HAU (-0.441) has the lowest average gap amongst all the universities as well as in agricultural universities. The highest gap in agricultural universities is observed in YSPUA (-1.345). KUK has the minimum average gap (-0.640) and the UoJ has the maximum average gap (-1.037) across the general types of universities.

Suggestions

University libraries should get feedback from the users in order to identify areas where they are not satisfied.

Library authorities should analyze the feedback, find the reasons for poor service, check the available resources, check the feasibility to add additional resources, plan to enhance the quality of services and implement the plan.

Quality is a continuous process and the library authorities must get feedback in order to enhance it.

CONCLUSION

It is a fact that dissatisfied users may not come back and either they may remain dissatisfied or they may seek alternate option of informational resources. In both the cases, the image of library shall be affected adversely. Libraries must take appropriate steps to get feedback from the library users about their perception towards quality of library services. In addition to feedback, library authorities, after going through the present library system, should carry out the study to find the gap between 'what' the library perceives regarding the users' expectation and 'what' the user actually receives from the library. The libraries may use the SERVQUAL model after necessary modifications. The tool shall be very helpful for understanding the needs of the users. After using this tool, library authorities may be able to highlight the major areas where the users are dissatisfied most and address those grievances.

Finally, it can be summarized that there exists a gap in the perception and expectation of library users. The study also highlights the perception of library authorities towards application of management dimensions in the libraries of different universities. The result of the study has identified the services which need immediate attention of the library authorities in order to enhance quality. The other university libraries may carry out similar studies in order to evaluate their services and take managerial action accordingly in order to enhance the quality of library services.

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Research Growth Pattern and Author Collaboration of Cardiology Research During 1991-2010

C. Baskaran

ABSTRACT

The study presents cardiology literature records retrieved from MEDLINE database for the period 1991-2010. This research shows that maximum number of records (829) was during 2000, followed by 826 in 2003 and 789 in 2002. Relative Growth Rate (RGR) and Doubling Time (Dt) was found to be in increasing and decreasing trend shown during the period of study. The paper reveals a study of the authorship pattern and collaborative research in the field of cardiology. The degree of collaboration mean score was 0.70 and highest score 0.88 in 1991 exhibits during the period of study.

Key words: Cardiology; MEDLINE; Relative growth rate (RGR); Doubling time (Dt); Degree of collaboration.

INTRODUCTION

Bibliometrics is a quantitative study of written communication and it is essential for the effective management of libraries within their budget provisions. The quantitative data is used to keep control over the cost of library collection and essential books and periodical collections that satisfy the needs of the readers.

The major focus of the study was to apply the bibliometric analysis with a view to analyze the performance of research output in cardiology literature. It aimed to examine the emergence of research areas, research groups and countries with a view to map the cognitive or intellectual structure of research. Further, this study described out the relationship between authors, institutions, journals and articles and other means of insisting the peer review procedure¹. Bibliometric studies prove that bibliometric indicators play an important role in the policy decisions and in evaluation of research

performance. It is observed that there is considerable evidence that bibliometric indicators play an important role in the evaluation of research Performance of individual scientists and research groups².

Price³, on the basis of survey of Chemical Abstracts, observed a steady trend towards multiple authorship, thereby holding that if it continues at the present rate, by 1980, the single author papers will be extinct. Though the above postulation may not hold true, a decline in the number of scientific papers published by one single author is evident. Bibliometric analysis of diabetes literature indexed in the MEDLINE database for the period 1995-2004 shows that maximum number of records (13244) was during 2003, followed by 12690 in 2002 and 11061 in 2001. Relative Growth Rate (RGR) was found to be decreasing year wise. The doubling time (Dt) was found to increase every year. Ranking of the journals based on the quantum of research output on diabetes during 1995-2004 shows that USA in the largest contributor of literature on diabetes research. The nature of growth of literature in geology during 1987 to 1996, the type of collaboration among authors and the trend of growth during this period, degree of collaboration among various categories of authors, correlation of the growth of various

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categories of authors and impact of collaboration on growth of literature. From the study of five very old journals of geology, it was noticed that the increase in collaboration and, simultaneously, decrease in the amount of publication verifies that geology is a fully developed field of study. It is therefore, concluded that in a highly developed field, although the number of collaborative publications are more, the rate of growth of publications is low⁴.

The growth of world social science literature under the six sub disciplines viz., Anthropology, Economics, History, Psychology, Political Science and Sociology which were derived from the CD-Rom version of the Wilson Social Science Abstracts for the period 1983–1998⁵. An Investigation was made on the authorship pattern in Aquaculture Journals, based on the data collected from Aquatic Sciences and Fisheries Abstracts Part I (ASFA I) for a period of 3 years i.e. 1991, 1996 and 2001. In all the years, multiple authored contributions were more than that of single authors in all broad areas of aquaculture as the values of contributions of multiple authors ranged from 57.1% to 90.8% in different aspects of aquaculture. The degree of collaboration was found to be 0.85 for all the three years and it ranged from 0.83 (1991) to 0.86 (1996 and 2001). The research productivity of diabetes conforms to Bradford's Law of Scattering⁶.

OBJECTIVES

The specific objectives of the present study were,

1. To study growth of literature in the field of cardiology

2. To analyze Relative Growth Rate (RGR) and Doubling Time (DT) of cardiology literature over the study period
3. To measure single vs. multi-authored papers in this study
4. To observe degree of collaboration of authors in cardiology

METHODOLOGY

Data from the cardiology literature records published during 1991-2010, was searched and retrieved from MEDLINE CD ROM database, the bibliographic details like author, title, publication type, language, year, address of the contributors, country of publication, source etc. were collected. The retrieved records were converted into visual FoxPro and loaded in SPSS for the purpose of analysis. The data was also analysed with the toolbox named Bib-excel developed by Olle Pearson, Inforsk, Umea Univ (Sweden). Relative Growth Rate (RGR) and Doubling Time (Dt) of Cardiology particularly in records recovered in G8 countries was noticed. Author affiliation of these records was identified for observing the authorship pattern along with the degree of collaboration.

Analysis

Quantum of Cardiology research productivity

The cardiology research productivity included in MEDLINE for the period 1991 to 2010 databases of cardiology literature is shown in Table 1. Total of 12,015 records were covered in the database. It was found that the maximum number of records (829) was published during 2000, followed by 826 in

Fig 1: Quantum of Cardiology research productivity

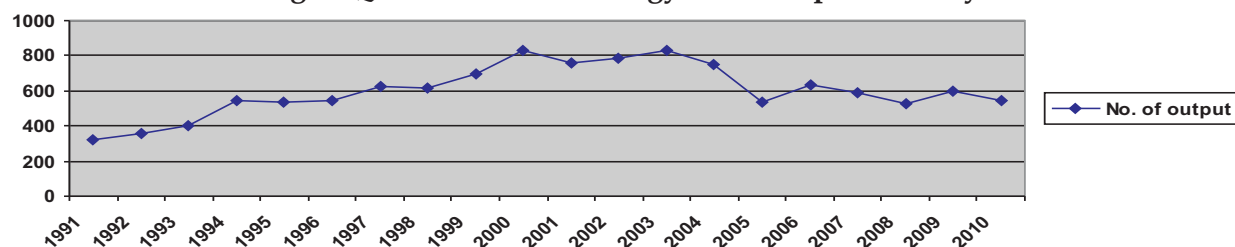


Table 1: Quantum of Cardiology research productivity in G8 Countries

Year	No.of output	Percent	Cumulative
1991	318	2.64	318
1992	357	2.97	675
1993	402	3.37	1077
1994	542	4.51	1619
1995	534	4.44	2153
1996	547	4.55	2700
1997	624	5.19	3324
1998	619	5.15	3943
1999	692	5.75	4635
2000	829	6.89	5464
2001	757	6.3	6221
2002	789	6.56	7010
2003	826	6.87	7836
2004	753	6.26	8589
2005	532	4.42	9121
2006	638	5.31	9759
2007	587	4.88	10346
2008	524	4.36	10870
2009	602	5.01	11472
2010	543	4.51	12015
Total	12015	100	

2003 and 789 in 2002. On the whole, it was noticed that from 1991 onwards, there was a gradual increase and then a gradual decrease and increase in trend from 2004 to 2010 (Figure 1).

Relative Growth Rate (RGR)

The Relative Growth Rate (RGR) is the increase in number of articles/ pages per unit of time. This definition is derived from the definition of relative growth rates in the study of growth analysis of individual plants and effectively applied in the field of cardiology. The mean Relative Growth rate (R) over the specific period of interval can be calculated from the following equation.

$$1-2 \quad R = \frac{\log_e W - \log_e W}{2^T - 1^T}$$

$$1-2 \quad R = \frac{\log_e W - \log_e W}{2^T - 1^T}$$

Whereas

-

1-2 R = mean relative growth rate over the specific period of interval

$\log_e W$ = log of initial number of articles

$\log_e W$ = log of final number of articles after a specific period of interval

$2^T - 1^T$ = the unit difference between the initial time and final time

The year can be taken here as the unit of time. The RGR for articles is hereby calculated.

Therefore

1-2 (aa-1 year-1) can represent the mean relative growth rate per unit of year over a specific period of interval.

Doubling Time (Dt)

There exists a direct equivalence between the Relative Growth Rate (RGR) and Doubling Time (DT). If the number of articles/ pages of subject double during a given period, then the Difference in the logarithms of numbers at the beginning and end of this period must be logarithms of number 2. If natural logarithm is used this difference has a value of 0.693. Thus, the corresponding Doubling Time for each specific period of interval and for both articles and pages can be calculated by the formula,

$$\text{Doubling time (Dt)} = \frac{0.693}{R}$$

Therefore,

$$\text{Doubling time} = \frac{0.693}{1-2 R \text{ (aa-1 year-1)}}$$

and

$$\text{Doubling time for pages Dt (p)} = \frac{0.693}{1-2 R \text{ (aa-1 year-1)}}$$

Table 2: RGR and Dt for Cardiology research Output

Year	No. of Output	Cumulative	W1	W2	RGR	Doubling time (Dt) 0.693
						R
1991	318	318	0	5.76	0	0
1992	357	675	5.76	5.87	0.11	6.3
1993	402	1077	5.87	5.99	0.12	0.57
1994	542	1619	5.99	6.29	0.3	2.31
1995	534	2153	6.29	6.28	0.01	69.3
1996	547	2700	6.28	6.30	0.02	34.65
1997	624	3324	6.30	6.43	0.13	5.33
1998	619	3943	6.43	6.42	0.01	69.3
1999	692	4635	6.42	6.53	0.11	6.3
2000	829	5464	6.53	6.72	0.19	3.64
2001	757	6221	6.72	6.62	0.1	6.93
2002	789	7010	6.62	6.67	0.05	13.86
2003	826	7836	6.67	6.71	0.04	17.32
2004	753	8589	6.71	6.62	0.09	7.7
2005	532	9121	6.62	6.27	0.35	1.98
2006	638	9759	6.27	6.45	0.18	3.85
2007	587	10346	6.45	6.37	0.08	8.66
2008	524	10870	6.37	6.26	0.11	6.3
2009	602	11472	6.26	6.02	0.24	2.88
2010	543	12015	6.02	6.29	0.27	2.56

Relative Growth Rate (RGR) and Doubling Time (Dt)

It is seen from Table 2 that RGR has been decreasing from 1991 (0.10) to 2010 (0.09). On the other hand, the Doubling Time (Dt) has shown decreasing and increasing trend. The data in Table 2 reveals that doubling time has increased from 0.57 in the year 1991 to 69.3 in the year 1995.

Single vs. multiple authorship pattern

Table 3 highlights the analysis of single Vs multiple authored pattern of cardiology research productivity as observed in this study. The analysis reveals that the multi authored papers account for more than 40.14 percent than single authored papers during the period of study. It can be shown that there is an

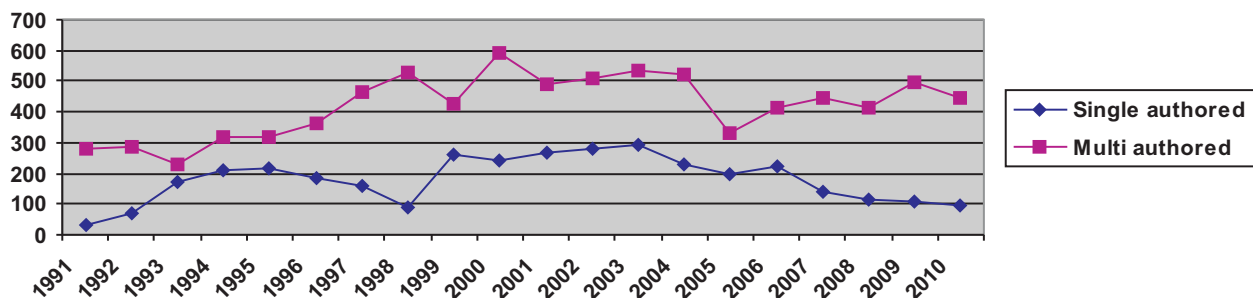
increasing trend towards multiple authorship. It can be inferred from the analysis that cardiologists pay more attention to team research. It can be seen that maximum number of papers are two authored and there is a decreasing trend in the number of authors in team of research as depicted in Fig 2.

Degree of Author collaboration co-efficient

Subramanyam⁷ proposed a mathematical formula for calculating author's degree of collaboration in a discipline. The degree of collaboration among authors is the ratio of the number of multi-authored papers published to the total number of papers published in a discipline during certain period of time. The degree of collaboration coefficient among authors is measured mathematically as,

Table 3: Single vs. multiple authorship in cardiology research productivity

Year	Single authored	Multi authored	Total No. of output	percent
1991	35	283	318	2.64
1992	72	285	357	2.97
1993	174	228	402	3.34
1994	212	330	542	4.53
1995	217	317	534	4.44
1996	186	361	547	4.55
1997	162	462	624	5.19
1998	89	530	619	5.19
1999	264	428	692	5.78
2000	239	590	829	6.89
2001	268	489	757	6.32
2002	278	511	789	6.51
2003	294	534	826	6.87
2004	229	532	753	6.26
2005	198	334	532	4.42
2006	224	414	638	5.33
2007	140	447	587	4.88
2008	112	412	524	4.36
2009	106	496	602	5.02
2010	98	445	543	4.51
Total	3597	8418	12015	100

Fig 2: Single Vs. multiple authorship in Cardiology research productivity

$$C = \frac{N_m}{N_m + N_s}$$

Where, c= degree of collaboration

N_m = number of multi authored papers

N_s = number of single authored papers

The degree of collaboration in different years is calculated as per the equation proposed by Subramaniam is presented in Table 4. The

degree of collaboration over the years from 1991-2010 is calculated and it varies from 0.56 to 0.88. The mean value is found to be 0.70. There is increasing and decreasing trend on author collaboration as seen in Fig 3.

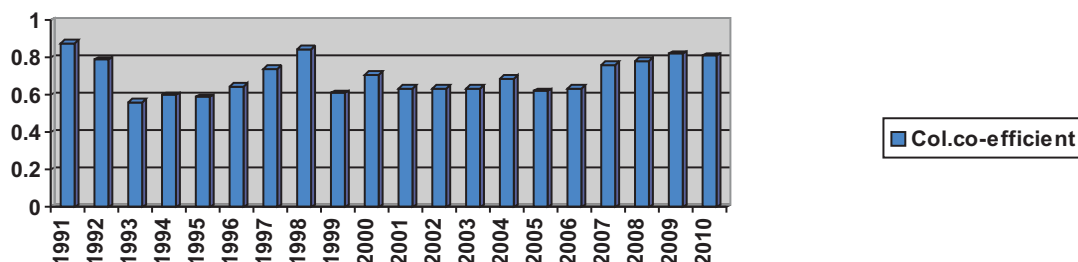
CONCLUSION

This study investigates the degree of author collaboration in the cardiology literature at G8

Table 4: Degree of author collaboration

Year	Single		Multi		Total no. of papers (NS+Nm)	Degree of collaboration
	Authored (NS)	Percent	authored (Nm)	Percent		$C = \frac{Nm}{Ns+Nm}$
1991	35	0.97	283	3.36	318	0.88
1992	72	2	285	3.38	357	0.79
1993	174	4.83	228	2.7	402	0.56
1994	212	5.89	330	3.92	542	0.60
1995	217	6.03	317	3.76	534	0.59
1996	186	5.17	361	4.28	547	0.65
1997	162	4.5	462	5.48	624	0.74
1998	89	2.47	530	6.29	619	0.85
1999	264	7.33	428	5.08	692	0.61
2000	239	6.64	590	7	829	0.71
2001	268	7.33	489	5.8	789	0.64
2002	278	7.72	511	6.07	789	0.64
2003	294	8.17	532	6.31	826	0.64
2004	229	6.36	524	6.22	753	0.69
2005	198	5.5	334	3.96	532	0.62
2006	224	6.22	414	4.91	638	0.64
2007	40	3.89	447	5.31	587	0.76
2008	112	3.11	412	4.89	524	0.78
2009	106	2.94	496	5.89	602	0.82
2010	98	2.72	445	5.28	543	0.81
Total	597	29.93	8418	70.07	12015	0.70

Fig 3: Degree of collaboration of G8 cardiology publication



counties level. The study reflects a considerable upward trend seen from 1991-2000 in collaborative cardiology research output and indicates towards collaborative research. The data suggests that there was significant research trend in the field of cardiology research during the study period. It was observed that the highest score of Relative Growth Rate (RGR) of 0.35 and Doubling Time (Dt) of 69.3 were found during the study period. Also, it was observed multi authored papers account for more than 40.14 percent than single authored papers during the period.

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Users' Satisfaction Towards Satellite Libraries: A Study of MD University Rohtak

Sanjay K. Kaushik*, Ramdiya Bhargava**

ABSTRACT

Library is the heart of any university system, where students, research scholars, teaching faculty as well as retired academicians, use the library and spend their valuable time to gain information throughout the years. Users are the key persons of any library system. All the luxuries of information – revolution and problems of information explosion are centered on the user and his convenience. Understanding the user needs is half the battle won in providing information services. The success of any information system depends considerably on how best the system design is based on a close and accurate understanding of the user. To put it paradoxically, the user is not only the most important aspect, but is also a dynamic component of information system. As such, understanding the user is an important and a continuous activity. The performance of any library can be evaluated on the basis of the extent of satisfaction of users. Hence, there is a need to conduct the use and the users' survey studies to evaluate the existing print and non-print resources, services, and facilities.

Key words: Users' studies; Users' satisfaction; Users' survey; Library survey.

INTRODUCTION

Library is a social and non-profitable organization. Here the user is given the most preference and attention. All sincere efforts are made to know his/her needs and to satisfy these to the best of library professionals' level. The four major abilities of a library professional which help him in satisfying the needs of his users' are:

- i. Knowledge of information sources
- ii. Knowledge of the user community and their needs
- iii. Capacity of analysis, interpretation and consolidation of information
- iv. Communication skills

No doubt, all the areas mentioned above are included in the curriculum of almost every library school and being taught there. Still the

area of knowing the user community and their needs is neglected one. There is a need to understand that the basic determinant of the nature and norms of any library should be its user. It is they who should, ultimately speaking, determine the stock and acquisition policy and type of services to be provided to meet their expressed and unexpressed needs.

Thus, every academic and research institution has at least one library. In big institutions like a University, there are departmental libraries as well in addition to the main library.

Maharshi Dayanand University has a central library named as 'Vivekananda Library'. The library is situated in the centre of the university campus having a huge collection of books (3,00,000), back volumes (48,000) along with e-journals and other printed and non printed materials. The have a computer laboratory with fifty computers equipped with internet facility and also have a multimedia lab. All the teaching departments are situated in the surrounding of the Vivekananda Library. The registration of users is done by the Vivekananda Library.

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Besides the Vivekananda Library, 5, Departmental libraries are also established in the university campus. Departmental libraries are known as:

1. Law Library
2. UIET Library
3. IMSAR Library
4. Math. Library
5. HTM Library

Objectives of the study

The major objectives of the study are:-

1. To find out the satisfaction level of the users about infrastructure of departmental libraries
2. To find out the satisfaction level of the users about the collections in the departmental library
3. To find out the satisfaction level of the users about services provided by the departmental library
4. To find out the level of helpfulness of library staff

METHODS

To achieve the above objectives, a questionnaire containing 16 questions was prepared. The questionnaire was distributed among the users (Students, Research Scholars, Faculty members etc.) of all five departmental libraries. About 300 questionnaires were distributed but only 145 filled questionnaires were received back. The data so collected was then coded, tabulated and analyzed.

Literature review

Somaratna and Peiris (2011)¹ conducted a study to know the service quality in University of Colombo Libraries. The study used the questionnaire to collect the data. The results indicated that around seventy percent respondents used the library very frequently. They observed that users are concerned with

staff attitude, complete collection and ease of access, e-resources available in the library and user awareness programmes, physical facilities provided by the library, the library catalogue as well as the security status of the library when experiencing library services.

Mahaptara (2011)² in his study of Odisha University of Agriculture and Technology found that more than 44% users are satisfied with the latest collection of the library whereas 35% users are dissatisfied. As far as collection of journals is concerned 22.5% respondents found it as very helpful are helpful whereas 45% respondents indicated that collection of journals are not helpful. In case of the use of library in their personal academic success, 3\4th of the respondents mentioned that very helpful followed by 17.5% as helpful and the remaining as somewhat helpful.

Natarajan and others (2010)³ found that majority of faculty members and research scholars are aware about the e-resources of the library. As much as 58.97% faculty members and 62.02% research scholars were using e-resources available in Annamalai University Library. They found that e-journals are extensively used by faculty members (49.57%) and research scholars (37.96%). The majority of users were agreed that if training is provided, it would lead to better utilization of e-resources.

Padmamma and others (2002)⁴ conducted a study to evaluate the use of resources and services and seek the users opinion on the adequacy of the users satisfaction at JJM Medical College, Karnataka. The study found that a majority of users visit library to consult books and journals. Text books are found to be the most used resource. Most of the users were satisfied with the physical facilities of the college library.

Veeranjaneyulu (1993)⁵ in his study on the use of resources and services of a S.V. Medical College library, Tirupati found that respondents were not satisfied with the services provided by the college library. The resources available with the library were also found inadequate.

Lohar and Kumbhar (2005)⁶ in their study on Teachers' attitude towards library resources and services in aided and unaided first grade colleges in Shimoga District concluded that text books were used more frequently than any other material. They also indicated that faculty was not aware of using library resources and services properly due to the lack of proper orientation programmes.

RESULTS

The results of the survey conducted are discussed under various sub-headings:

Physical Infrastructure

The basic framework of any organization must be aesthetic and attractive. A well designed library invites the users to visit it. The library should be equipped with best comfortable furniture (such as reading tables, chairs, stools etc.), computers, printers and others equipments required for using library services. The buildings of the library must be airy and clean. The views of the users of the departmental libraries of M D University are provided in the Table 1.

The results indicate that 27 respondents are highly satisfied and 66 respondents are satisfied with the seating capacity in their respective departmental libraries whereas 40 respondents are somewhat satisfied and only 12 respondents are dissatisfied in this regard. In case of reading area environment a majority of respondents are satisfied and another 18 respondents are highly satisfied. Only 22 respondents have shown their dissatisfaction. Other 27 respondents are somewhat satisfied and there are 2 respondents who have not expressed their opinion. Regarding climatic conditions most of respondents i.e. 84 respondents are satisfied and 36 respondents are highly satisfied. Only ten respondents are dissatisfied and there is one respondent who did not express his opinion. As far as computer and printing facilities are concerned 73 respondents are dissatisfied and 24 respondents are satisfied. It is the ground reality that computer/printing facilities are provided in the departmental libraries at a very small scale.

Documents Collection

A rich collection of books, journals etc enhance the prestige of a library. The library

Table 1: Assessment of infrastructure and other facilities

Particulars	Highly Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	No Opinion
How much satisfied you are with the seating capacity of your departmental library	27	66	40	12	
How much satisfied you are with the reading area environment of your departmental library.	18	76	27	22	2
How much satisfied you are with the climatic conditions like lightning/heal/cooling exhaust of air reading area environment of your departmental library.	36	84	14	10	1
How much satisfied you are with the computer and printing facility provided by your departmental library	14	24	16	73	18

Table 2: Assessment of library collection

Particulars	Highly Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	No Opinion
How much satisfied you are with the book collection of your departmental library	15	63	45	22	
How much satisfied you are with the collection of current journals of your departmental library	10	39	41	39	16
How much satisfied you are with the collection of news papers/magazines of your departmental library	25	50	26	25	19
How much satisfied you are with the collections of back volumes of journals of your departmental library	12	35	45	38	15

Table 3: Assessment of library services

Particulars	Highly Satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	No Opinion
How much satisfied you are with the circulation services of your departmental library	29	63	30	21	2
How much satisfied you are with the OPAC of your departmental library	4	42	19	59	21
How much satisfied you are with the internet services of your departmental library	9	27	19	71	19

always tries to provide documents best suited to its users and in this way the library collection is developed. As far as the collection of departmental libraries is concerned, it limited to the specific subject of the department concerned.

A perusal of Table 2 shows that 63 respondents are satisfied and 15 respondents are highly satisfied with the book collection in their respective libraries. Another 45 respondents are somewhat satisfied and 22 respondents are dissatisfied. In the matter of collection of current journals 39 respondents are satisfied and 10 respondents are highly satisfied. Similarly 41 respondents are somewhat satisfied and 39 respondents are dissatisfied. It can be noticed that 16 respondents did not express their opinion. A

good number of respondents are somewhat satisfied and dissatisfied. In case of news papers and magazines 50 respondents are satisfied and 25 respondents are highly satisfied whereas 26 respondents are somewhat satisfied and 25 respondents are dissatisfied. However, 19 respondents mentioned that news papers and magazines are not available in their library. Regarding collection of back volumes 45 respondents are somewhat satisfied and 38 respondents are dissatisfied. Other 15 respondents showed no opinion/not available. Only 35 respondents are satisfied and 12 respondents are highly satisfied. The reason behind it is that except law library no other departmental library maintains the collection of Back volumes. The back volumes pertaining to the subjects of

others departmental libraries are maintained by the Vivekananda Library.

Library Services

A library is known by its services. To provide quality services at the right time in the right manner is the basic aim of any library. The quality of services of a library really enhances its reputation among the users.

The library collection of whatsoever quality has a limitation of use until and unless it is open for circulation. As departmental libraries are established to reach to the users, the circulation of documents particularly books is one of the most used library service. The opinions of the respondents are shown in Table 3. It is indicated that 63 respondents are satisfied and 29 respondents are highly satisfied with the circulation of books whereas 30 respondents are somewhat satisfied and 21 respondents are dissatisfied. Only 2 respondents did not express their opinion. Online Public Access Catalogue (OPAC) is a very good tool for the users of a library to search the bibliographical details of the collection. Further they can also know the available document is whether issued to anybody else, if yes when it is expected to be returned. The results of the study indicate that 42 respondents are satisfied and only 4 respondents are highly satisfied. 19 respondents are somewhat satisfied, 59

respondents are dissatisfied and 21 respondents expressed no opinion. The authors perceive that this might be due to lack of awareness of How to use OPAC among the users. Hence there is a need to conduct special training programme on the use of OPAC.

Nowadays, even it cannot be imagined that one can complete his studies or research or teaching without the proper use of internet. MD University has a very well knit Local Area Network. The access to the internet at every terminal of the LAN is through a lease line of 1GBPS bandwidth. The access points are provided in the rooms of faculty, computer laboratories, offices, departmental libraries, etc. At some places the Wi-Fi connectivity is also provided. When speaking of internet services only 27 respondents are satisfied and 9 respondents are highly satisfied. Near about half of respondents i.e. 71 respondents are dissatisfied and 19 respondents are somewhat satisfied. Other 19 respondents expressed no opinion. Internet services are provided to the users in Vivekananda Library and these are not provided in the departmental libraries.

Staff

The services of a library are largely dependent upon the knowledge, attitude and willingness of its staff. Where the library staff is well knowledgeable, qualified, co-operative, helpful and willing to serve the users, the

Table 4: Assessment of attitude of library staff

Particulars	Highly satisfied	Satisfied	Somewhat Satisfied	Dissatisfied	No Opinion
How much satisfied you are with the co-operation of the staff of your departmental library	32	39	19	55	
How much satisfied you are with the helpfulness of the staff to assist you in retrieving books	22	44	27	50	2
How much satisfied you are with the helpfulness of staff in searching the required information.	28	33	28	55	1
How much satisfied you are with the knowledge of resources by the staff.	27	39	37	40	2

quality of service automatically improves significantly.

Only the bearer can tell where the shoe pinches, in the same manner the users of a library are the best judges. Their feedback about the services and attitude of library staff can considerably guide the library to improve the quality of services. Table 4 shows that majority of respondents have a positive impression about the library staff. It is found that 39 respondents are satisfied, 32 respondents are highly satisfied, 19 respondents are somewhat satisfied and 55 respondents are dissatisfied with the co-operation of their respective departmental library. As far as helpfulness of staff to assist the users in retrieving books is concerned, 44 respondents are satisfied and 22 respondents are highly satisfied. Other 27 respondents are somewhat satisfied and 50 respondents are dissatisfied. Only 2 respondents expressed no opinion. About the Helpfulness of staff in searching the required information, 33 respondents are satisfied, 28 respondents are highly satisfied, 28 respondents are somewhat satisfied and 55 respondents are dissatisfied. Only one respondent expressed no opinion. In the matter of knowledge of resources by the staff 39 respondents are satisfied and 27 respondents are highly satisfied. Other 37 respondents are somewhat satisfied and 40 respondents are dissatisfied. Only 2 respondents expressed no opinion.

It is really a matter of concern that almost one third of the respondents are not satisfied with the helpfulness of the library staff of the departmental libraries. The authority at top level of the library administration should look into this position. The efforts should also be made to arrange some motivational programs for library staff. The reward system for the most helpful library official judged by the users can also be introduced.

CONCLUSION AND SUGGESTIONS

The present era is era of technology. Now e-books and e-journals are available on internet in both modes open source and

subscription-based. So it is almost mandatory for a modern library to provide computers along with internet connection so that more and more documents can be accessed and used by its users. As per the suggestions received in response to the questionnaire, there is a need and demand from the users to provide proper internet facilities in the departmental libraries as well. The users of University Institute of Engineering and Technology, and Institute of Hotel and Tourism Management have indicated a lack of books in UIET and HTM library. Hence there is a need to cater their need and provide the required resources to the users. In some departmental libraries like Maths Library and UIET library there is need, as felt by the users, for News papers and magazines relating to current affairs for competitive exam. A few users have suggested that Library staff should be more co-operative, skillful and knowledgeable.

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Marketing of Agricultural Information in Cyber Era

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ABSTRACT

The objective of marketing of information is to enhance the use of information; to generate resources for running the service continuously; to facilitate production of user oriented rather than producer-oriented product. The present article deals with marketing of agricultural information in cyber era. Discuss the availability of information technology and its use in agriculture. Proposed web based Agricultural Information Dissemination System(AgrIDS). Stressed the need for mechanization of agricultural information for easy marketing and the employability skill required to disseminate the information.

Key words: Agricultural information; Marketing; Agricultural technology; Web-based agricultural information.

INTRODUCTION

India farming community is facing a multitude of problems to maximize crop productivity. In spite of successful research on new agricultural practices concerning crop cultivation, the majority of farmers is not getting upper-bound yield due to several reasons. One of the reasons is expert/scientific advice regarding crop cultivation is not reaching farming community in a timely manner. Due to several reasons the current agricultural extension system, in India is unable to deliver the advice to all the farming community in a personalized manner. The traditional ways of advice dissemination through radio, newspapers, magazines, television are not meeting the expectations of the farmers due to the lack of coverage, accountability and personalized advice.

Marketing is planning and managing the organization's exchange relations with its

clientele. It consists of studying the target market's needs, designing appropriate products and services, and using effective pricing, communication, and distribution to inform, motivate, and serve the market. The American Marketing Association defines 'marketing as those activities, which direct the flow of goods and services, from production to consumption'. Marketing also includes identifying more active and demanding users; study their demand characteristics; and study the underdeveloped utilization patterns. Marketing means 'many things to many people'. It may be selling or it may be promotional (Conner & Chakrabarti, 1971).

Need for marketing of information

Marketing of information is an aggregate of activities directed at satisfying human information needs and wants through exchange process; marketing involves viewing the whole information service or product from the point of view of final results i.e., from the use and user point of view. Libraries and information centers and quite recently the information brokers have been putting considerable efforts in the design of information services/products for the purposes of marketing them. An in-depth

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analysis of several such services/products revealed that many of them were not user oriented, largely because of the non-involvement of the users in the product design. Also, the extent of use remained unknown to the generators, because of the lack of proper feedback.

The objective of marketing of information is to enhance of use of information; to generate resources for running the service continuously; to facilitate production of user oriented rather than producer-oriented products. This requires:

1. Identification of target customers/user groups.
2. Determination of their needs.
3. Designing of services / products appropriate to their needs.
4. Choosing right type of distribution channel.
5. Feedback and evaluation of products.

There are certain specific features of information that makes it very difficult to market it. Information is a consumable item, but unlike the other consumables, it does not get exhausted with use. At the same time, it costs to produce and deliver and requires substantial efforts to consume information (Proctor, 1991).

Agricultural technology

On the positive side, as a result of intensive research on advanced seeds, technologies and agricultural practices, a large amount of agricultural knowledge has been produced at agricultural research labs and educational institutes. Also, India has a large pool of qualified agricultural experts to provide appropriate advice to the farmer given a crop situation. Also, using the current advances in agricultural technology, the effect of the several factors on the crop growth can be understood and the possible corrective steps can be known in advance. For example, the effect of the improper, excessive and untimely application of fertilizers can be reduced by providing information about the amount and

type of fertilizers required to get the maximum yield, given the type of the soil, and the crop details. Also, the information about the type and dosage of the pesticide can be provided, given the type of pest and corresponding crop details (Drucker, 1954).

Problems of information gap

Even though agricultural expertise and knowledge is available, in India, the majority of farming community is practicing old methods due to the fact that research and scientific advice is not researching the needy farmers in a timely manner. Also, as most of the farmers are illiterate or with little education, there is a large gap between agricultural research and its application, resulting in continuous suffering in the farming community due to low crop yield. There is a room to reduce the negative effect of several factors that disturb the crop by providing the timely expert information. It is necessary to improve the method of dissemination of advanced scientific advice to the needy farmers in a timely manner. Indian farmers need timely expert advice to make them more productive and competitive. So the problem here is, with the available resources and technology, to investigate methods to disseminate expert advice to the farming community in a cost effective manner (Baker, 1984).

One of the methods to provide the crop status to Agricultural Expert (AE) is to facilitate them to visit each farmer's field on a daily or weekly basis to understand the crop situation. An AE is a person who possesses an advanced nontrivial knowledge about the management of crops. He also possesses an expertise to recommend the possible steps based on the current crop situation. However, even though India has a large pool of agricultural scientists with appropriate expertise, it is difficult to cover all the farmers on a weekly/daily basis due to the cost and time factors. Moreover, such a system will be expensive to build and maintain (Sergeant, 1999).

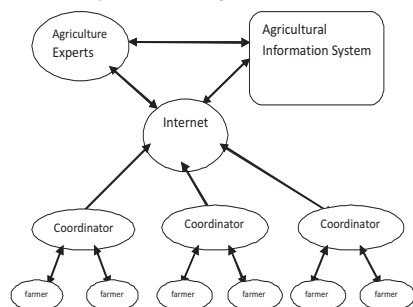
Information technology opportunity

Recent information technology revaluation (mainly the database and Web technology) provides an opportunity to build a cost-effective and scalable agricultural expert advice dissemination system to disseminate to fresh expert agricultural advice to the farmers, both in a timely and personalized manner (Levitt,1960). The basic idea here is rather than taking agricultural expert to the crop, the crop status is brought to agricultural expert in the form of both text and image information. In the proposed system only information moves; agricultural experts and farmers stay at their respective places. In this way it is possible to build a cost-effective and scalable agricultural information system (Bateson,1989).

The main objective of the proposed system is to increase the profitability of the farmer by increasing the efficiency of agricultural input and reducing the cost of production. This should be achieved by keeping the soil alive for long run (health of soil). The achieve of these objectives by giving timely advice to the farmers in the following areas.

1. Choice of the crops to be based on soil tests.
2. Pest warning and pest control.
3. Fertilizer use in terms of amount and timing.
4. Marketing.
5. Scheduling of crop activities.
6. Weather information and the type of the crop to be raised by forecasting weather.
7. Strategic planning.

Web-based Agricultural Information Dissemination System (AgrIDS)



Source: An agriculture information dissemination system.

In the proposed system, the agricultural experts get the information about the crop situation through internet in the form of both text and image data, and then generate the appropriate advice which is sent to the farmer through the internet (Berry,1991). The AgrIDS contains four parts: Farmers, coordinators, agricultural Information System (AIS). See source: All parts are connected through Internet.

(i) Farmers

farmers are the end users of the system. They form the bottom layer. They can be illiterate and speak a local language. They are not expected to use the system directly. However, if they are educated and have an Internet connection, they can use the system themselves.

(ii) Coordinators

A coordinator is associated with a group of farmers. The coordinator possesses agricultural experience and basic data entry skills. He visits the crop fields of the farmers associated with him and enters the relevant data (through text and images) into the system. Also, when the system produces the advice, the coordinator contacts the concerned farmer and explains the personalized advice to him.

(iii) Agricultural Experts

AEs use research data, soil data historical data, and other information data, and other information to generate appropriate recommendation and store this advice in the system. The AEs interact with the knowledge base and crop environment by staying at the same place; the AEs rarely visit the farmer's crop. Instead, the crop environment itself is provided to the AEs in the form of both text and images. So in AgrIDS, both the users and the AEs stay at their respective place of work; only information moves around through Internet.

(iv) Agricultural Information System

It is a computer based information system which contains all the related information such as the details of the farmer with corresponding soil and crop information. The information's are sent by the coordinators, the details of various crop properties and so on.

Mechnization of agricultural information

Agricultural Mechanization is a yearlong, lab intensive course in which students develop an understanding of basic principles of selection, operation, maintenance, and management of agricultural equipment in concert with utilization of safety and technology. Topic covered include: small and large gas and diesel engine repair, power transfer systems including hydraulic, pneumatic and robotic systems, arc, metal fabrication such as MIG, TIG and SMAW welding, concrete, wood, metal, electricity and electronics, recalcultating aquaculture systems, hydroponics systems, surveying, precision farming equipment, remote sensing technology and global positioning systems equipment, building agriculture related buildings and structures including greenhouse, tillage, planting, irrigation, spraying, grain and forage harvesting, feed and animal waste management systems, agricultural industry communications and customer relations, safety the safety resources career opportunities in the area of agricultural mechanization and employability skills (Lovelock,1984).

Farm Management

Farm Management is a yearlong course that introduces students to the principles of farm management on a farm, economic principles, decision-making, methods for organizing and planning getting started in the farming business, farm record keeping systems risk management, and career opportunities in the field of farm management.

Landscape Management

Landscape Management is a yearlong course that provides the student with an overview of the many career opportunities in the diverse field of landscape management. Students are introduced to the procedures used in the planning and design of a landscape using current technology practices, the principles and procedures involved with landscape construction, the determination of maintenance schedules, communications, management and employability skills necessary in landscaping operations, and the care and use of equipment utilized by landscapers. Upon completion of the programme, students have the opportunity to receive an industry State Certificate of mastery in Landscape Management.

Natural Resource Management

This course is a yearlong programme that provides students with a background in natural resource management. Students are introduced to career opportunities in natural resource management and related industries, understanding forest ecology importance, recognizing trees and their products, tree growth and development, forest management, measuring trees, timber stand improvement and urban forestry, soil features, erosion and management practices, conservation practices, water cycles, uses, quality standards, reducing water pollution, conducting water quality tests, watersheds, and its importance to natural resource management, hazardous waste management, native wildlife, waterfowl, wetlands, and fish management, topography map use, management of recreational areas, game bird and animal management, outdoor safety, and weather. "hands-on" learning activities encourage students to investigate areas of environmental concern including: identification and management of ecosystems, natural succession identification, natural communities, recycling and management of waste in the environment, soil conservation management practices, land uses, and air quality (Coote,1994).

Advance in Life Science

Advance in Life Science, is a standards-based, interdisciplinary sciences course that integrates biology, chemistry, and microbiology in an agricultural context. Students enrolled in this course formulate, design, and carry out animal-based laboratory and field investigations as an essential course component. Students investigate key concepts that enable them to understand animal growth, development and physiology as it pertains to agricultural science. This course stresses the unifying themes of both biology and chemistry as students work with concepts associated with animal taxonomy, life at the cellular level, organ systems, genetics, evolution, ecology, and historical and current issues in animal agriculture. Students completing this course will be able to apply the principles of scientific inquiry to solve problems related to biology and chemistry in highly advanced agricultural applications of animal development.

Plant and Soil

Advanced Life Science, Plant and Soil, is a standards-based, interdisciplinary science course that integrates the study of advanced biology, chemistry, and earth science in an agricultural context. Students enrolled in this course formulate, design, and implement agriculturally-based laboratory and field investigations as an essential course component. These extended laboratory and literature investigations focus on the chemical reactions of matter in living and nonliving materials while stressing the unifying themes of chemistry and the development of physical and mathematical models of matter and its interactions. Using the principles of scientific inquiry, students examine the internal structures, functions, genetics and processes of living plant organisms and their interaction with the environmental. Students completing this course will be able to apply the principles of scientific inquiry to solve problems related to both biology and chemistry in the context of highly advanced agricultural applications of plants and soils.

Foods

Advanced Life Science, Foods, is a standard-based, interdisciplinary science course that integrates biology, chemistry, and microbiology in an agricultural context. Students enrolled in this course formulate, design, and carry out food based laboratory and field investigations as an essential course component. Students understand how biology, chemistry, and physics principles apply to the composition of foods, food nutrition and development, food processing, and storage. Students completing this course will be able to apply the principles of scientific inquiry to solve problems related to biology, physics and chemistry the context of highly advanced agricultural applications of food.

Towards and information market model

The marketing of consumer products has developed into a sophisticated operation, largely in response to the maturation of markets and the consequential increased completion (Jain, 1994). The market of information, in contrast, is relatively low standard, and whilst information has some characteristics which differentiate it from conventional consumer products, there is nevertheless considerable similarity which allows an analogous model for the information market to be constructed.

A Generalized consumer product marketing Model

The generalized market model thus has four major components:

1. The manufacturer/Supplier.
2. The delivery system (wholesaler/distributor/retailer).
3. The market research/advertising sector.
4. The consumer.

All four components interact strongly each other, and their relative importance reflects the type of market, the level of competition, and the opportunities for adding value. The total value of a market can only increase if

more consumers become involved or if more value can be added to the product and hence higher prices can be charged. Moreover, this total added value has to be partitioned between the principles in the market, and if the market is not growing, then competition increase between the participants for market share competition thus encourages mergers, vertical integration, and new types of selling (e.g. mail order, telephone selling, computer selling).

An Information market model

The analogy between information and consumer products is sufficiently strong to enable a market model to be derived from the consumer products model. However, there are differences, and these must be considered in taking the analogy to its extreme. The most important difference is that consumer products cease to exist once they have been used. Whereas information can be reused in time and again. In case information may increase its value through use. Again, most consumer products start deteriorates as soon as they are produced and much of their value derives from processing to preserve their lifespan. Information is contrast, does not deteriorate over/time, although it has a value in time related to its use but not production (Kotler,1994).

Struture of organizational framework

Modern agriculture libraries do not run by themselves; they require a lot of organization and administration strategies to run with multifarious activities and resources. The libraries have to deal with different types of knowledge resources and in the present context the multimedia information sources and communication media to meet the contemporary changing demands of the users and the changing formats of materials. An array of responsibilities is vested upon the librarian as an entrepreneur in the industry of knowledge. These demands of him to have an adequate knowledge of the management techniques for adjusting the working force to

the working environment and, the working force to maximize the library service to the academicians at the lowest cost and with reasonable effort. It requires specialized organizational skills to bring semblance between the user demands and the varieties of information sources. The libraries have possessed written documents, printed documents, and non-print media consisting of audio-visuals, microforms, maps, atlases and innumerable varieties of traditional multimedia resources. The profession of Librarianship is encountering this contemporary transformation in the media change as well as meeting the equally changing demands of the users.

In addition to above the technological impact on libraries in the last two decades have thrown out new challenges with the advent of magnetic, optical and other electronic sources of information. Most of the traditional multimedia sources are still in existence in large number in many academic libraries and they would ever vanish from the scene of the academic library environment like the maps, atlases, photographs, other audio-visuals and the microforms. Most of these sources are also held on the modern media that is the optical devices, hence the academic libraries have challenging tasks to handle the varieties of these media and put them into use.

As regards to the collection, though the libraries under survey are not very strong in possession of traditional as well as current multimedia collection, but the fact is very conspicuous as most of university libraries are not completely conversant with their multimedia wares. However considering the emerging trends in the new media it is obvious that libraries will have to possess the new media particularly CD-ROM based information sources. Besides they have to depend largely on Internet based resources, digital libraries and access to library web-sites through the growing number of library networks. It becomes incumbent upon all library fraternity that they acquire the organizational skill and the knowledge of handling them and also to meet the user demands in the context (Adeloye, 2003).

CONCLUSION

The library can be called an information treasury and the library user is a communication of information. Information is a vital resource for national development, increasing realization of the role of information has resulted in the establishment of information systems to provide a variety of information services and products. It is an essential step in the planning, designing, and use of such services and products for optimal use of information. Library acquisition, organization and dissemination must be based on the modern concept of marketing to achieve reader satisfaction. It must endeavor to nature, culture of customer service to enhance its image in the eyes of the users.

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National Knowledge Commission: A Milestone in the History of Indian Library Movement

N. Subramanian

ABSTRACT

India has tremendous potential resources. It is the need of the hour to make knowledge based developments in almost all fields. Hence, National Knowledge Commission (NKC) was constituted in 2005 as a high level advisory body to the Prime Minister of India, with a mandate to guide policy and generate reforms under the chairmanship of Dr.Sam Pitroda. The NKC has taken steps to review library services and to examine the present standards of public, private, institutional and specialized libraries and other information resources. In this paper, an attempt has been made to present the objectives of NKC and its recommendations to develop the libraries.

Key words: National Knowledge Commission; Objectives; Recommendations.

INTRODUCTION

Today, India needs a knowledge based development in all walks of life in all fields. It has tremendous potential resources. The ability of a nation is to use and create knowledge for their citizens. To meet the global challenges more strongly, we should make knowledge-based developments in all fields. For this purpose, National Knowledge Commission (NKC) was constituted in 2005 as a high level advisory body to the Prime Minister of India, with a mandate to guide policy and generate reforms under the chairmanship of Dr.Sam Pitroda.

The commission had a designated time frame of three years, from 2nd October 2005 to 2nd October 2008. It focused on the transformation of India into a vibrant knowledge-based society. The first annual report (2006) was published in January 2007.

OBJECTIVES OF NKC

- Build excellence in the educational system to meet the knowledge challenges of the 21st century and increase India's competitive advantage in fields of knowledge
- Promote creation of knowledge in Science and Technology (S&T) Laboratories
- Improve the management of institutions engaged in Intellectual Property Rights (IPR)
- Promote knowledge applications in Agriculture and Industry
- Promote the use of knowledge capabilities in making the government an effective, transparent and accountable service provider to the citizens and promote widespread sharing of knowledge to maximize public benefit.

Based on the above objectives, the commission seeks to develop appropriate institutional frame works to strengthen the educational system in India, promote research and development and facilitate the applications of innovative knowledge in health, agriculture and industry. The

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commission concentrates on the following five key areas of the knowledge paradigm:

- Access to knowledge
- Knowledge concepts
- Creation of knowledge
- Knowledge applications and
- Development of better knowledge services

Access to knowledge

Providing access to knowledge is the most fundamental way of increasing opportunities.

Knowledge concepts

It is organized, distributed and transmitted through the educational system such as school education, higher education, professional education and vocational education.

Creation of knowledge

A nation can be developed in two ways. One is to use existing resources and another is to discover new resources. Both activities are involved in the creation of knowledge and protecting the created knowledge.

Knowledge applications

Knowledge can be applied to promote technological change and facilitate reliable and regular flow of information to the industry, agriculture, small and medium scale enterprises.

Delivery of services

Technology provides an opportunity to ensure accountability, transparency and efficiency in government services. E-governance is one of the ways to increase transparency of government functioning.

Libraries as Gateways to Knowledge

Libraries, particularly public libraries, are playing a pivotal role in dissemination of

knowledge and are an extremely important element of the foundation of knowledge economy. It is not a building stacked with books. It is a repository and source of information and ideas. It is a place for learning and enquiry and for generation of thoughts and creation of new knowledge. It has the potential power to bridge the gap between the "information poor" and the "information rich" by ensuring the people of all sectors have easy access to knowledge.

The NKC has taken steps to review library services and to examine the present standards of public, private, institutional and specialized libraries and other information resources. They are drawing attention to the following eight priorities:

1. To redefine the objectives of the country's library and information services sector
2. To identify constraints, problems and challenges relating to the sector to recommend changes and reforms to address the problems and challenges to ensure a holistic development of information services in all areas of national activity
3. To take necessary steps to mobilize and upgrade the existing libraries and information systems and services, taking advantage of the latest advances in Information Communication Technology (ICT)
4. To explore possibilities for innovation and initiate new programmes relevant to our national needs, especially to bridge the gap between the 'information rich' and 'information poor' within society
5. To suggest means of raising standards and promoting excellence in library and information science education including re-orientation and training of working professionals
6. To assist in setting up facilities to preserve and give access to indigenous knowledge and the nation's cultural heritage
7. To set up adequate mechanisms to monitor activities for securing the benefits of acquisition and application of knowledge for the people of India

8. To examine any other issues that may be relevant in this context

The Commission's first recommendations on libraries were forwarded to the Hon'ble Prime Minister in December 2006 as highlighted in its First Annual Report (2006).

Recommendations

The working group analyzed that in order to achieve the goal of creating a knowledge society, we must help the people of India to overcome 'information poverty'. In the information and electronic era, libraries in India need to make a paradigm shift from their present strategy of collection or acquisition of knowledge to a strategy of knowledge access. Libraries and librarians have to recognize their social functions and their critical role in creating a knowledge society. The library and information sector is committed to support the creation of a knowledge society by providing equitable, high- quality, cost-effective access to information and knowledge resources and services to meet the informational, educational, recreational and cultural needs of the community.

Keeping this in mind, the NKC made the following recommendations for the development of the libraries:

Set up a National Commission on Libraries

There is a need for a permanent, independent and financially autonomous statutory body to address the entire library related concerns and measures.

Prepare a National Census of all Libraries

A national census of all libraries should be prepared by undertaking a nation-wide survey. Based on this, a survey of user needs and reading habits should be periodic at the national level as part of the National Sample Survey.

Revamp Library and Information Science Education, Training and Research Facilities

The proposed Mission on Libraries must assess, as soon as possible, the manpower requirements of the country in the area of library and information science management and take necessary steps to meet the country's requirement through library and information science education and training. The government should establish a well-equipped institute for advanced training and research in library and information science in the name of "Indian Institute of Library and Information Science" for providing necessary quality services.

Re-assess Staffing of Libraries

In the changing context, it is necessary to assess the manpower requirements for different types of libraries and departments of library and information science and to analyze the job descriptions, qualifications, designations, pay scales, career advancement and service conditions.

Set up a Central Library Fund

A specified percentage of the central and state education budgets must be earmarked for libraries. In addition, a Central Library Fund should be instituted for upgrading existing libraries. This fund should be administered by the National Mission on Libraries.

Modernize Library Management

Libraries should be so organized and the staff so trained that they become relevant to user communities in every respect. A proposed outline for this modernization includes a model Library Charter, a list of services to be performed by libraries and proposals for a library network and a National Repository for Bibliographic Records.

Encourage Greater Community Participation in Library Management

It is necessary to involve different stakeholders and user groups in the managerial decision making process of libraries. Public libraries must be run by local self-government through committees. Libraries should integrate with all other knowledge-based activities in a local area to develop a community-based information system. In rural areas, the responsibility for village libraries and community knowledge centres must lie with the Panchayats.

Promote Information Communication Technology (ICT)

The catalogues of all libraries should be put on local, state and national websites, with necessary linkages. This will enable networking of different types of libraries and setting up of a National Repository of Bibliographic Records and a centralized collaborative virtual enquiry handling system using the latest ICT. Libraries should be encouraged to create more digital resources by digitizing relevant reading materials in different languages subject to copyright regulations. For this purpose, it is recommended to use free and open-source software.

Facilitate Donation and Maintenance of Private Collections

There are numerous rich, private and personal collections in India which need to be identified, documented and preserved for posterity. The proposed National Mission may set up a Committee on Private and Personal Collections.

Encourage Public/Private Partnerships in Development of Library and Information Services

Philanthropic organizations, industrial houses and other private agencies should be encouraged, through fiscal incentives to develop existing libraries or set up new libraries with ICT infrastructure to provide better library and information services.

CONCLUSION

NKC has historical importance in the history of Indian Libraries' movement. The *Chairman, Prof. Sam Pitroda released the Commission's Second Annual Report to the nation in Jan 2008*. The second report includes recommendations on portals, health information network, legal education, medical education, management education, open and distance education, open educational resources, innovation, intellectual property rights (IPRs), legal framework for public funded research and traditional health systems.

The Government extended the term period for another six months to April 2009. We hope that the recommendations on library and information services will be highly appreciated and may give social recognition to the information professionals in the forthcoming generations.

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Reprography Services in University Libraries of Haryana: The Way it can be Beneficial for the Users?

S.S. Joshi

ABSTRACT

This is an age of democracy and in a democracy every public utility institution has to justify social desirability on any service. Library as such has been included among institutions of public utility services which enlighten the whole society. But the welfare services which are delivered by the library require quantitative as well as qualitative measurement of their effectiveness, known as benefits to the community. One such service which is very essential on the part of the university libraries is reprographic services. Today, one cannot think of university libraries without this service. This paper discusses the use and effectiveness of reprography services in university libraries of Haryana and the way it can be beneficial for the users.

Key words: Reprography; Copying technique; Duplicating technique.

INTRODUCTION

The word "Reprography" came into existence in 1963 at the First International Congress of Reprography at Cologne, Germany. It is originated from the combination of two terms i.e. reproduction and photography. Reproduction means producing the thing afresh and the photography is a technique of producing an image with the action of light on any light sensitive material. Thus, reprography may be described as the technique of producing single or multiple copies of any document through copying or duplicating process. Following are some of the definitions of reprography:

1. Landau defines it as "Art of producing single or multiple copies of document whether by photographic or other means". (<http://publications.drdo.gov.in/gsd/collect/dbit/index/assoc/HASH9f08.dir/dbit0906003.pdf>) accessed on 20/07/2012.

2. According to Oxford Dictionary "The science and practice of copying and reproducing documents and graphic material" <http://oxforddictionaries.com/definition/english/reprography> accessed on 23/07/2012.

3. The free dictionary defines it as "The process of reproducing, reprinting, or copying graphic material specially by mechanical, photographic, or electronic means. <http://www.thefreedictionary.com/reprographic> accessed on 23/07/2012.

Use of reprography

It is not possible for the university libraries to issue every material which is required to the users. Books are issued to the users as per their entitlement. The solution to the problem is reprography. A user can get the photocopy of the material, required. The prerequisite for reprography is the availability of original material in the library. In case the original material is available in the library, then reprography has the advantages stated as under:

- It provides access to the documents.
- Permanent copy can be made even if the document is damaged or in poor condition.

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- It facilitates the same copy of the original document.
- Provision of enlargement and reduction of sizes.
- Replica can be made quickly.
- No need of re-typing and rewriting, hence the technique is time saving.

Reprography can be categorized in two parts

1. Copying technique
2. Duplicating technique

Copying technique can further be divided into

- (a) Conventional technique
- (b) Non conventional technique

Conventional system is based on photography which includes, contact copying (without lens), optical copying (with lens), photostat and microphotography etc.

Non conventional system is electrostatic process which includes electrographic, electrostatic and electro fax etc.

Duplicating technique consists of offset printing and Stencil etc. (Balarama, 1967)

METHODOLOGY

It is a well known fact that research is an organized study to ascertain something new. The following methods were adopted in the study to collect the data.

- Observation method
- Personal visit
- Interview method

OBJECTIVES

India is a developing country. Funds are not available in abundance in university libraries. Proper use of funds is the need of the hour.

The purpose of the study was to know how maximum benefits of reprography can be obtained by using the least resources and to suggest the necessary reforms in the area of reprography sections of university libraries so that the user may be satisfied.

In brief following were the main objectives of the study:

- To know the status of reprography in university libraries in the present scenario.
- Which reprography service is highly in demand
- Which reprography service is beneficial for the users, whether provided by library itself or through commercial vendor
- How the scarce resources can be used efficiently
- How need of the users related to reprography can be satisfied efficiently

Area of study

Seven university libraries of Haryana with respect to reprography facilities were studied. The university library of CDLU, Sirsa and the library of LLRUVAS, Hisar had no setup for reprography for the users. The rest of the university libraries provide only single reprography facility to the users, i.e. photocopy facility.

Analysis

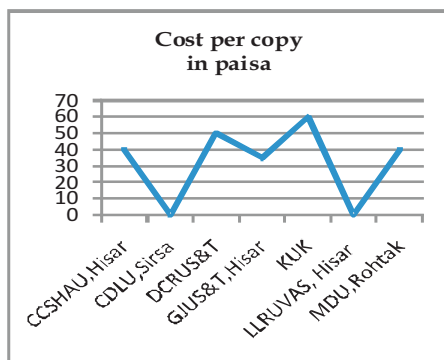
From the Table1 and line chart1 given below it can be seen that the lowest rates of photocopy are in the Library of GJUS&T, Hisar. The vendor is charges only 35 paisa per copy. The highest rates are charged in the libraries of Kurukshetra University, Kurukshetra at 60 paisa for each copy from the students. During the visit and personal interview the satisfaction level was observed to be higher in the users of GJUS&T library, Hisar. It was also been observed that five university libraries of Haryana provide the photocopy service through commercial vendor

The university libraries of CDLU, Sirsa and LLRUVAS, Hisar, do not provide any reprography services to their users due to nonexistence of proper setup. It was also been found that a contractor in the library can only survive if he is able to repair/maintain the machine at his own level, because the repairing centers of the famous companies charge 35 - 40 paisa per page as maintenance contract. The cost of the photocopy will enhance if the contractor is dependent on repairing center for maintenance of machines. It was also found that contractors of all the university libraries repair the photocopy machines themselves.

Table 1: Rates of photocopies in selected university libraries

Name of University	Cost per copy (in paisa)
CCSHAU, Hisar	40
CDLU, Sirsa	-----
DCRUS&T	50
Murthal	
GJUS&T, Hisar	35
KUK	60
LLRUVAS, Hisar	-----
MDU, Rohtak	40

Chart 1 : Comparison



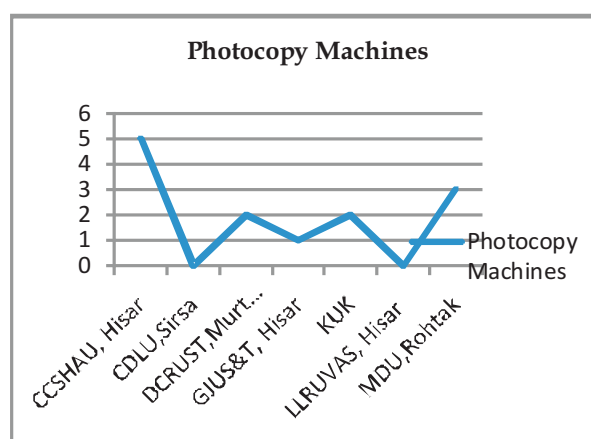
Photocopy machines have been installed in the university libraries of Haryana by the contractors at their own level.

The following Table 2 and line Chart 2 depict the number of photocopy machines used by the contractors in university libraries of Haryana.

Table 2: Quantity of photocopy machines available in selected university libraries

Name of University	Photocopy machines
CCSHAU, Hisar	5
CDLU, Sirsa	-----
DCRUS&T	2
Murthal	
GJUS&T, Hisar	1
KUK	2
LLRUVAS, Hisar	-----
MDU, Rohtak	3

Chart 2: Comparison



The photocopy contractor of CCSHAU, Hisar University Library used five machines to meet the photocopy requirement of the users. The contractor of the university library of GJUS&T, Hisar used only single photocopy machine for the purpose. Three photocopy machines were used in the university library of MDU, Rohtak. University libraries of DCRUS&T, Murthal and KUK served the purpose with two machines each. The university libraries of CDLU, Sirsa, and LLRUVAS, Hisar, had no photocopy machine for the users. During the visit maximum demand of photocopy was seen in the CCSHAU, Hisar.

The photocopy service, if provided by the contractor also enhances the income sources of the university. Hence, university and users may be considered in a win-win position, because university gets the income in the form of rent and the user gets photocopy on cheap rates. The Table 3 shows the mode of

Table 3: Data regarding photocopy facilities in selected universities

Name of University	Name of Library	Reprography facility by contractor or Library	For members or official use	Rent	No. of persons deputed by the contractor	Other Reprography Machines
CCSHAU, Hisar	Nehru Library	Contractor	Members	2096/- per month	2	Nil
CDLU, Sirsa	Vivekananda Library	_____	Official use	N.A	1	Nil
DCRUS & T, Murthal	Sarswati Pustkalya	Contractor	Members	Rs 98000/- per annum	2	Nil
GJUS&T, Hisar	University Library	Contractor	Members	3000/- per month	1	Nil
KUK	J.L.Nehru Library	Contractor	Members	1000/- per month	2	Nil
LLRUVAS, Hisar	-----	-----	-----	-----	-----	-----
MDU, Rohtak	Vivekanand library	Contractor	Members	Only electricity bill charged	2	Nil

reprography, clientele, amount of rent, no. of persons deputed and other reprography machines available in the university libraries of Haryana.

The Table 3 shows that contract based reprography service is available for the members in the university libraries of Haryana except CDLU, Sirsa, and LLRUVAS, Hisar. University library of MDU, Rohtak charges only electricity bill from the contractor, The university library of Deenbandhu Chotu Ram University of Science & Technology, Murthal, charges Rs 98000/- per annum; CCSHAU, Hisar charges Rs 2096/- per month; GJUS&T, Hisar, Rs 3000/- per month; and Kurukshetra University, Kurukshetra Rs 1000/- per month. In spite of photocopy, no other facility of reprography is available for users in any of university library. The users of all the libraries were satisfied with services of respective libraries. It was also observed that earlier university library of GJUS&T, Hisar, provided photocopy service to the users at their own level. But the users were not satisfied with the service due to many reasons and the library too felt lot of problems to meet their needs related to photocopy. With respect to reprography, university libraries in Haryana

only provide photocopy service; hence the word "Reprography" may be treated as "Photocopy" in the following context. Advantages and disadvantages of reprography techniques provided by the library out of its own resources, or the reprography service provided by the library through contractor have been described below in detail:

Reprography by university library

Due to the information explosion, the requirements of the users for the reproduced material are increasing day by day. There is pressure on the university libraries to facilitate the reprography service to the users. Following are the benefits to the users of reprography services if provided by the library:

Subsidized rates

University libraries do not provide reprographic service to earn profits. Satisfaction of the users is their motto. They provide reprographic services at cheap rates as compared to market rates.

Time saving

Every library material cannot be issued to the users. But requirement of users are increasing day by day. If the reprography facilities are provided by the library, the user can get the document reproduced within the library without going elsewhere.

Preservation of rare books

In case of rare books university libraries produce the replica of the rare material keeping in view the Copyright act.

Replacement of pages

University libraries may also use this service to replace torn/damaged pages of books.

Reduced pressure on counter staff

The material or contents required by the users can be reproduced within the library, which reduces the workload on circulation counter.

Quality control

Routine checking by the authority of the library can monitor the quality.

Energy saving

The availability of reprographic facility within the library saves the energy of the users.

Sizes as per requirement

As per the requirements of the users, the facility of reduction and enlargement is also provided in the library.

Saving of space

It is well known fact that books and other reading material occupy a lot of space in the library. Through some techniques of reprography lot of storage space can be saved.

Problems of reprography services if provided by the library

Scheduled time

The reprography facility is provided by the library only in scheduled hours. After library timings such facility is not provided by the library

Lack of responsibility

It has been observed that many employees work on the reprography machines at different times, which creates sense of irresponsibility among the employees.

Delayed services

Government employees are not quick enough to provide any service, which results in delayed service.

Psychology of staff

It is the general psychology of the library staff deputed on the reprography machines to feel irritated if any user wants large number of copies to be reproduced.

Resistance to change

Again, the main problem which is felt by the users, generally in the university libraries, is the problem of resistance to change among employees. But in case of contract based reprography system this problem is rarely faced by the users.

Malfunctioning of machines

In case of any disorder in any machine in library, it takes time to get the same repaired.

Problems of university libraries

It has been observed that merely purchase of reprography machines does not serve the purpose. University libraries also face some problems in providing reprography services, which are as under:

- Lack of trained staff
- Insufficient machines
- Time constraint
- Cost of machines
- Space problem
- Inadequate supply of stationary/allied items
- Maintenance cost

A university library should take into consideration the following things for better reprography services to the users.

- Best use of scarce resources
- Low-priced service
- Quality service
- Quick services
- Technically trained staff
- Appropriate latest machines
- Measures to avoid wastage
- Separate reprography section
- Polite behavior of the staff with users

Contract- based reprography

Since the libraries are already facing the problem of scarce resources, how can the resources be saved without affecting the satisfaction level of the users? It has been observed that users are generally not satisfied if the reprography services are provided by the library through its own resources. The solution of the problem is contract- based reprography services. Initially, the terms and conditions may be framed to safeguard the interest of the users. On the basis of these terms and conditions the contract should be offered. Following are the benefits of contract- based reprography:

Saving of funds

In contract- based reprography services, library need not invest on manpower, machines and furniture etc. Library also saves

its other expenses, i.e. expenditure on electricity, stationary etc.

Income

In this service, contractor pays rent of the space allocated for the purpose; hence the income of the library will increase.

Service quality

Profit is the main aim of the contractor. To earn more profits the contractor will attract more users by giving them quality services.

Subsidized rates

Due to competitive age people quote less rates to get the contract and the benefit of low cost directly goes to the users.

No time constraints

To earn more profit contractor always try to utilize the resources upto maximum without caring about holidays and opening and closing timings of the library.

Credit facility

Contractor can provide the credit facility to his regular customers which are not otherwise possible if the reprography services are provided by the library.

Reprography facility for everyone

In contract- based reprography service due to the profit motive, the facility is provided to every member of the society provided that separate space has been allocated by the library for reprography section and working of this section does not create any hindrance in the routine working of the library.

Immediate service

Contractor always tries to provide quick services to the users so that he may be able to earn more profits.

Alternative manpower and machine

In case of technical disorders of machine or non availability of concerned manpower, the contractor always has alternatives to these problems. He is always ready with alternatives to avoid losses and the benefit directly goes to the users of the service.

Idea of two contractors

In established university libraries, it has been found that there is always a lot of rush in reprography section causing delayed service. Sometimes contractor finds himself helpless to satisfy the immediate requirements of the users. The problem can be solved if the contract is given to two contractors at a time. The benefit will directly go to the users which is:

- Service at low rates
- Improvement in quality
- Speedy services
- Polite dealing to attract more and more users

One thing that is to be taken into consideration is that reprography section should be separate from the library so that gazetted holidays, opening and closing hours may not affect the service.

Secondly, the contractor has sole motive of profit. He can provide the inferior quality to the users. This problem can be resolved at the time of contract. Certain parameters should be fixed for quality control of reproduced material. It is pertinent to mention here that contract should be given only in case of photocopy and not for other forms of reprography. The only drawback of contract-based reprography system is that library has to depend on the contractor for official reprography. But the problem can be solved through mutual understanding. (Joshi, S.S.)

CONCLUSION

- Reprography service, if provided by the university library, is not economically beneficial either for the user or for library.

- Most of the universities libraries in Haryana provide only photocopy service through contractor.
- Only contract-based photocopy service is beneficial for the university libraries as well as the users.
- Microfilming or any other form of reprography except photocopy is not used in any university library of Haryana.
- University libraries of LLRUVAS, Hisar and CDLU, Sirsa, do not provide any reprography service to their users.
- The highest rates of photocopy are charged in the university library of KUK.
- Lowest rates of photocopy are charged in university library of GJUS&T, Hisar
- The users of university library of GJUS&T, Hisar, are observed to be the most satisfied, keeping in view the quality of paper and rates.
- If reprography service is provided by the library, the total cost of producing single page of photocopy comes to more than 60 paise after including maintenance expenses, salary to the staff employed in reprography section, interest on investment, depreciation, expenditure on furniture, electricity and stationary etc.
- Contractors in all the university libraries repair their machines at their own level.
- In spite of doing microfilming, libraries are interested in the digitization of the material keeping into consideration the Copyright Act,
- The demand of reprography, expected work load, the probable expansion of reprography in future and the availability of latest techniques in the market, should all be taken into consideration before planning reprography.

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Impact and Implications of ICT Changes in Krishnasamy College of Engineering & Technology, Cuddalore

S. Dhanavandan*, M. Tamizhchelvan**

ABSTRACT

The magnetic word 'Information Technology Changes' has been chanted the globe and been incorporated in organizational, managerial, developmental and marketing sectors. The services rendered with the help of ICT are faster and more effective. Recent developments in the fields of communication and information technology are indeed revolutionary in nature. An attempt has been made in this study to identify the information literacy in the usage of Information Communication Tool at the Krishnasamy College of Engineering & Technology in Cuddalore District.

Key words: ICT Tools; Electronic resources; Krishnasamy Engineering College.

INTRODUCTION

Engineering schools, particularly in the developed countries, have invested heavily in Information and Communication Technologies (ICT), not only to deliver education, but also to improve the quality of services that health professionals provide. Developing countries like India, where a scarcity of human resources in the engineering sector is a serious problem, can be a particular beneficiary of ICT education. Lack of educational institutions and qualified engineering educators, poor distribution of facilities and poor access to the latest educational infrastructure are some of the issues to be addressed to improve the quality of engineering education in developing countries. Advanced technology can address at least some of these problems.

Literature Review

Chandrashekhra and Mulla studied the usage pattern of electronic information resources among the engineering research community especially in Karnataka. They found that the research community seemed to move towards a greater international homogeneity. They discussed why developing countries like India were not fully utilizing the benefit of on-line electronic information resources¹. Nagaraju, Ramesh and Vithal in their findings showed that in India, most of the future library and information professionals would work in a digital or hybrid library environment². Varadharajan in his study says that a series of training courses on digital libraries could provide a good balance of topics covering the technological, technical, management and social issues³. Haneefa conducted a study that e-mail services have been used by large percentage of users. The study added that a good number of users were not satisfied with application of ICT in the libraries⁴.

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Krishnasamy College of Engineering and Technology

The Krishnasamy College of Engineering & Technology was coined by Sri Krishnasamy

Reddiar Educational Trust in Cuddalore. It serves to the rural people not only technical education but also all fields of education under the founder, Dr. K. Rajendran M.S., FICS., FAIS. At present, the college has 6 departments and 1900 B.E/B.Tech., students, 350 post-graduate students and 200 employees. This college is affiliated with Anna University of Technology, Thiruchirappalli.

The Krishnasamy College of Engineering & Technology Library has a total collection of 40,000 volumes of books, 8000 back volumes of technical periodicals and technical reports. The library subscribes to over 200 technical periodicals, including 75 international. It has a digital library with 20 computers and online access to IEEE, IEE & ACM and its society publications though membership, and large number of full-text journals from various publishers. It also stacks nearly 2500 non-book materials which include CDs, DVDs and Audio/Video Cassettes. It also subscribes to the NPTEL Source for the students and faculties.

OBJECTIVES

The present study is to investigate impact and implication of the state-of-the-art ICT at the library of Krishnasamy College of Engineering & Technology, Cuddalore. In addition, the study also aims to achieve the following objectives:

1. To explore the role of ICT in engineering education;
2. To assess the impact of electronic information resources;
3. To identify hindrance to the use of electronic information resources;
4. To examine students' attitudes towards use of ICT;
5. To suggest measures for improvement of existing ICT-based resources and services.

METHODOLOGY

The study used a questionnaire spread over eight sections: (A) General profile of the respondent, (B) Attitude towards ICT, (C) Use of ICT, (D) ICT enabled teaching and research, (E) ICT training provision, (F) ICT skill of engineering students, (G) Access to engineering information on the Web, and (H) Constraints. To facilitate quantification and analysis of data, mainly close-ended questions were used along with checklists and rating scales. To capture a response and to have fewer missing responses, options such as "no opinion", "don't know", and "don't know about it" were also included. A random sample of 150 (25%) of 160 engineering students of Krishnasamy College of Engineering & Technology, Cuddalore, was selected and questionnaires were distributed among them. Of those, 128 (85.33%) questionnaires were returned completed.

DATA ANALYSIS AND DISCUSSION

Attitude of Engineering Students towards ICT

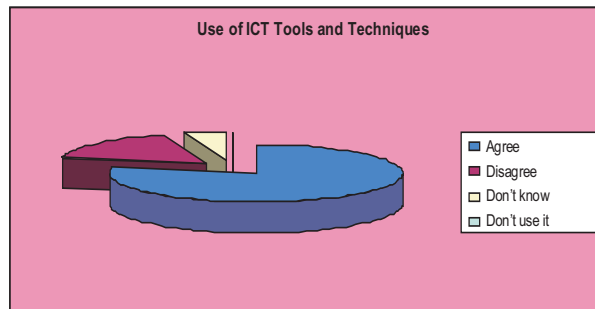
The survey found that a majority of respondents believed that ICT is essential for engineering education. In order to assess the attitude of engineering students towards ICT, they were asked whether they felt that engineering education would not be effective without ICT.

Table 1: Effectiveness of Engineering Education and Research

Use of ICT tools and techniques	Frequency	Percent
Agree	100	78.12%
Disagree	22	17.18%
Don't Know	6	4.68%
Don't use it	0	0%

Table 1 shows nearly the 80 percent of respondents agree that Engineering education will not be effective unless ICT tools and techniques are used in the educational process. It is evident from this data that the students realize that ICT tools and techniques should become a part of engineering education.

Figure 1: Effectiveness of Engineering Education and Research



Need for ICT Enabled Library Facilities

Students were asked to put forth their recommendations about ICT facilities.

Table 2: ICT Facilities Recommended by Students

ICT facilities	Frequency	Percentage
Library website	97	75.78
E-resources	81	63.28
Networking with library and information systems	79	61.72
Automation of library	76	59.57
Digital library facilities	61	47.65
Local Area Network for library	52	4.62

It is evident from Table 2 that three quarters of respondents recommended a library website for remote access to library resources and services. More than 60 percent recommended e-resources and an equal number recommended networking with other libraries and information system.

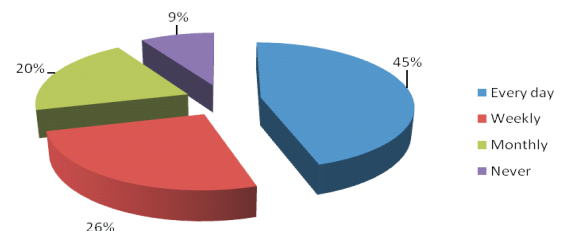
Use of ICT

Table 3: Frequency of Computer Use

College	Every day	Weekly	Monthly	Never
Respondents	45	26	20	9

Table 3 shows nearly half used a computer at least daily, with another quarter weekly and only about 20 percent using a computer monthly. The Nine percent never use a computer, which was quite discouraging. Although the students considered computers an integral part of engineering education, their overall use is infrequent.

Figure 2: Frequency of computer use



Use of Internet

More than 80 percent of respondents used the Internet. Table 4 summarizes the purpose and Frequency.

Most students used the Internet weekly to send and receive e-mail and chat with friends online. More than one quarter, however, used the Internet for accessing reading material recommended by their teachers.

ICT Literacy of Engineering Students

Surprisingly, there were still 3 (2.34%) engineering students who were not confident either in handling the mouse or the keyboard of a computer of the 128 students who responded to this survey, nearly all were at least "somewhat confident" about using the mouse and keyboard. About one-third of the students were not confident in using any word processing program. Nearly all were confident about web searching, and majorities were able to deal with computerized patient records.

Constraints in Use of ICT

More than half of respondents stated that application of ICT was not present in their course syllabus, with a nearly equal number who saw a lack of support from IT staff. Half

Table 4: Purpose and Frequency of Internet Use

Purpose of using Internet	Daily	Weekly	Monthly	Occasionally	Never
Chat	14 (10.94)	42 (32.81)	7 (5.47)	26 (20.31)	20 (15.62)
E-Mail	11 (8.59)	49 (38.28)	17 (13.28)	26 (20.31)	6 (6.25)
Information for Patent	9 (7.03)	11 (8.59)	12 (9.37)	12 (9.37)	47 (36.71)
Literature search	7 (5.47)	28 (21.87)	9 (7.03)	35 (27.34)	25 (19.53)
Reading to Course work	11 (8.59)	19 (14.84)	9 (3.03)	30 (23.43)	26 (20.31)

Table 5: Students' knowledge of computers and IT

ICT tools and applications	Not confident	Quite Confident	Confident	Very Confident
Computerized patient record	52 (40.63%)	16 (12.50%)	22 (17.19%)	16 (12.50%)
E-mail	9 (7.03%)	29 (22.66%)	37 (28.91%)	32 (25%)
Excel/other spread sheet	51 (39.84%)	19 (14.84%)	21 (16.41%)	17(13.28%)
Internet	7 (5.47%)	34 (26.56%)	39 (30.47%)	36 (28.13%)
Keyboard	3 (2.34%)	34 (26.56%)	43 (33.59%)	38 (29.69%)
Mouse	3 (2.34%)	26 (20.31%)	43 (33.59%)	47 (36.72%)
MS-Word	42 (32.81%)	22 (17.19%)	27 (21.09%)	26 (20.31%)

Table 6: Problems Accessing Electronic Information

Reasons	Frequency	Percent
E-Resources not available	40	31.25%
ICT not present in syllabus	72	56.25%
Inadequate number of PCs	59	46.09%
Lack of support from IT staff	71	55.46%
Lack of time	64	50%
Inadequate computer network	55	42.96%
Less computer lab	60	46.87%
Internet connectivity Slow speed	27	1.09%

indicated lack of time, and a significant number also mentioned the lack of computer labs and a campus network, with a smaller number mentioning a lack of availability of e-resources in the library.

RESULTS

The following major findings were noted

Nearly all respondents, i.e. 125 students (97.65 %) expressed the desire for a computer lab in their college. Ninety-nine (77.34%) students were of the opinion that ICT should be included in the undergraduate engineering syllabus; 69 (54%) students recommended that the engineering college library subscribe to e-resources for effective study and research; 100 (78.12%) students were of the opinion that engineering education will not be effective without ICT based study and teaching. A majority of students recommended that a library website be launched and the library should acquire electronic information resources.

CONCLUSION

The study found that ICT can be a useful tool to address problems in engineering education, but the lack of technology and resources is still a serious limitation. The

noteworthy point is that even after three decades, the inadequacy of qualified technical staff has stood in the way of users' satisfaction. The Engineering College library has not been able to use the services available at a national and international level. Another obvious finding is the absence of co-operation among the engineering libraries at national level, including the lack of even inter-library loan. Attention to these broad areas of weakness will go a long way towards improving the use of ICT in the library.

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Use and Impact of E-Journals in Libraries With Reference to Pondicherry University Library

V.R. Rajan

ABSTRACT

E-Journals are online Journals and explains its characteristics, its History, various types of E-journals and detailed steps involved E-journals on the web and Benefits of E-journals and finally various online subscribed by pond cherry library and the benefits gained to the user community and also user statistics reveals the increase the usage of E_Journals and created new awareness for the usage of E-Journals in the minds of the user communities.

INTRODUCTION

Knowledge is expanding at lightening speed. Students need to learn more, better and faster. Teachers should use innovative methods for teaching. Technology plays a crucial role in all the sphere of library activities today. The challenges posed by the advances in the field of information and communication technology, with the exponential growth in the size of storage, a phenomenal increase in the processing speed, decreasing cost of hardware and user friendly software, the technology provides ample of scope for new services and products. Thus E-Journals play a vital role in the changing scenario of libraries and information others. In 2004, Librarian Alireza Noruzi recommended applying Ranganathan's Five Laws to the Web in his paper "Application of Ranganathan's Laws to the Web"

1. Web resources are for use.
2. Every User his or her web resources.

3. Every web resource its user.
4. Save the time of the User.
5. The web is a growing organism.

What is E-Journals?

Electronic Journals may be defined broadly as any serial publications viz Journal, magazine, newsletter in digital format and made available on CD-ROM, Online systems and in the Internet has become primary medium for e-journals today. Based on the level of content, e-journal can be classified as scholarly research Popular (general public) and Industry or trade Journals.

Characteristics of E-Journals

- i) Issue include graphics, multimedia or links to other internet resources.
- ii) File Structure is hierarchical and uniform.
- iii) E-Journals include personalized service such as e-mail alerts.
- iv) E-Journals is accessible on web & online archives
- v) E-Journals issues and articles can be used by the user online and Print copies.

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History of E-Journals

E-Publishing is two decades old. The American Chemical Society was the first professional body to publish their journals in electronic form in 1983. The American Chemical Society, the Institute of Electrical and Electronics Engineers and the Institute of Engineers offer their prestigious journals in electronic form. The Online Computer Library Centre provides their Journals only through electronic form. The Electronic Journals Online service provides peer reviewed journals online, free of cost. Viz World Scientific, Singapore.

Individuals, Universities and research centers can access e-journals through net on the basis of payment and on agreement regarding the copyright. Viz www.sciencedirect.com

Types of E-Journals

i) Free Journals

Access to the Journal is not dependant on a subscription membership in an organization. Viz. www.Dlib.org

ii) Subscription based Journals : Require Payment

a) Free online against Print Journals

Viz. American Journal of Physiology. www.ajpcon.physiology.org

Current year access only. Current twelve rolling period. Achieve access.

b) Online only Journals

It indicates online Journals only and there no print counterparts.

Viz. www.jop.org/Journals/it JTI

c) Pay-Peer-view journals

Any single article can be viewed / downloaded by paying additional amount.

Viz www.ddj.com/store/

d) Virtual journals

Journals dealing on specific topics are grouped and access to them is provided.

Viz. www.press.unich.edu/jep/

Steps involved in Accessing E-Journals on the Web

- Connect the Journal website using its site address (URL).
- Select an issue, browse the table of contents.
- Authentication (user id,password/ validation).
- Online registration for initiating online access by providing the customer_id
- Range of IP numbers need to be mentioned in the online incense agreement form.
- Selection of an article for viewing abstract /full text. They may be an text or have format. PDF
- Search Title of Content /Bibliographic record and link to full text article Viz. ISI's Web of Science.
- Many free journals also require registration for online access.

Access requirements: Good ban width, laser printing for taking print copies of select articles in pdf or html formats, access points depend on the size of the organization and the number of users.

Major publishers of scholarly E-Journals

Many of the major scholarly societies/ publishers have made their journals available online.

- American Physical Society: www.aos.org
- American Chemical Society: www.acs.org
- American Medical Association: www.amaassn.org
- Elsevier Science: www.elsevier.com
- Cambridge University Press: www.cup.org

Benefits of E-Journals

1. The Subscription allows remote access.
2. More than one user at a time can use E-journals simultaneously.

3. Multidimensional features of E-journals encourage the users to use them round the clock.
4. E-journals are flexible and do not require physical processing, storage space and even environmental valuable.
5. Access to archival issues is available.
6. Dual Publishing is another added advantage.

E-Journals Boon for Pondicherry University Library

Pondicherry University is a Central University established by an Act of Parliament by the GOVERNMENT of India in October 1985 and recognized by the UGC under Section 2(i) and 12(b) of the UGC Act, 1956. It is affiliating University with a jurisdiction spread over the Union Territories of Pondicherry, Lakshwadeep and Andaman and Nicobar Islands. Moreover, The University has seven schools, a Directorate of Distance Education, a Community College, a Center for Adult and Continuing and an Academic Staff College.

University central library

The University Library was established on 11th September on 1986. It moved to an independent building in June 1990 with a carpet area of 31,204 sq.metres. At present, the Library has in its stock about 1,19,035 Books, 7697 Back Volume apart from UN depositories, Theses etc. covering a wide variety of subjects to facilitate current reading..It has access to around 6935 journals in full text and 13181 journals content pages with abstract wherever available. The Library is fully automated. and d with the introduction LIBSYS Software Package in the year 1997. and NAAC team have appreciated much on the progress shown by the Library.

UGC Infonet E-journals

The University Grants Commission has initiated a programme to provide electronic

access over the internet to scholarly in all areas of learning to the University sectors in India. The Programme is wholly funded by the UGC and administered and monitored by INFLIBNET. All Universities which come under UGC's purview will be members of the programme and it will be gradually be extend to college as well.

Out of 305 Universities 50 Universities including Pondicherry University have been included in the first phase of the UGC Infonet E-Journals programme.

Pondicherry University has been selected as one among twenty universities whose contents would be included in the JCCC (J-Gate Custom Content for Consortia) for Data interchange/resource sharing. through INFLIBNET.

CD ROM Journals Database Service

The University Library is having CD-ROM Network server with 7 CD-ROM drives which is used for browsing the abstracts and bibliographical information about the articles. To view the full text, 4 nos of stand-alone PC's with 24X CD-ROM drives are used. Laser print out facilities for retrieved full text articles and dot matrix print facility for print out of abstracts from CD-ROM databases are available for the users.

ELSEVIER science direct online journals

Thanks to our Ex Vice chancellor Dr. A.K. Bhatnager initiative on the introduction of the science direct in the year 2004, Seven major disciplines have been subscribed. online journals including Back files of the same disciplines. namely Computer Science, Mathematics, Physics and Astronomy, Materials Science, Biochemistry, Genetics and Molecular Biology, chemistry and Earth Sciences to 763 current and 623 archival journals provided by Elsevier Science Direct and can be accessed via intranet.

EBSCO Publishing E-journals

EBSCO Publishing Ltd.,- an online publishing company of U.S.A. provides access to the electronic journals databases viz. "Business Sources Premiere" and "Academic Search Premier" and the total number of 6800 full text and 8250 abstracts supplied by the EBSCO. It is exclusively belongs to Humanities and Social Sciences.

User education on E-journals

Pondicherry Library has been subscribing E-Journals namely Science Direct (online) Journals including Subject Backfiles and EBSCO E-Journals (online) for Humanities on Payment Basis and UGC Infonet:E-Journals on free of cost from 2004 onwards. The cost of two payment online subscription has crossed more than 75 lakhs. These E-Journals can be seen not only from University Library but also to all the Schools/Depts/Centre through campus Intranet . But however we have received poor response from the user Statistics provided by M/s Elsevier India(P) Ltd., New Delhi.

Analysis

As per the Dr. S.R. Raganathan Five Laws of Library Science, user orientation has been taken as a measure for awareness of the orientation programme. and we have organized orientation programme from 03.09.2007 to 11.09.2007. Consequently, more number of student from all the department were present and enriched the E-journal techniques taught by all the Library Professionals. Our resource persons are one Deputy Librarian, Seven Assistant Librarians and one Information Scientist have explained in detail on how to access the E-Resources on the computer and nicely demonstrated each and every branch of E-Journals and the

feedback received from them was highly outstanding and excellent. In this connection, The User Statistics after Orientation Programme were tremendous which are given namely Number of user prior to orientation Programme were 4699 and after the conduct of the orientation Programme were 9311 which clearly shows their lot of interest for E-Resources because of the awareness of E-Journals created by our University Library only

Moreover Our NAAC team has recently appreciated much about the collections of E-Resources available in the Library.

CONCLUSION

Increasing access to information has led to a shift in the traditional role of both the library and librarian. For effective dissemination of information online journals make their appearance on the net much before the print copies reach the subscribers. Therefore E-Journals is such a source, which reaches the user in right time at any place with all information.

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Scientometric Dimensions of Research Productivity in Universities of Karnataka

D.S. Amoji

ABSTRACT

An analysis of 3047 research articles published by the research community in the five universities of Karnataka has been reported based on the national consortia portal JCCC@UGC INFONET. The research publications contributed by the academic community between 1969 and May 2011 reveals that University of Mysore has highest research publications with 1100 articles appearing in JCCC@UGC INFONET portal. Authorship trend reveals that single author contribution is diminishing to a great extent with just 3.93% of authors published individually while 43.41% of authors have contributed with four and five authors. The domain wise publications are mainly from science stream, with Chemistry, Physics and Mathematics dominating the area of research contributions and Library and Information Science at ninth position. Application of Bradford's law reveals that onethird of scientific journals publish 2409 articles accounting for 79 percent of publication.

Key words: Scientometrics; Research productivity; Bibliometrics; Publication productivity; Core Journals; Authorship Pattern.

INTRODUCTION

Information is the lifeblood of research and developmental activities and the performance in the field of scientific development depends upon the extent of research and development (R & D) work done in the country. The infrastructure required to assist the R & D is generously provided for by three sources - the government, the industry and the university itself. It is stated that India has a very wide base of scientists producing a large number of research projects in the universities to procure a doctorate or part of research work. The norms of University Grants Commission for recruitment or promotion calls for development of research bent of mind for academic and research community, which has resulted in extensive research proposals and

publications at national and international level.

The existing literature on scientometric and bibliometric techniques, which have become tools to evaluate the productivity of research institutes, individual researcher and to map the growth of subject have been culled out and studies have been reported over a period of time. Publication and citation counts are being extensively used for evaluation purpose of an institutes some of them are Shubert and Braun (1981); Garg and Rao (1988); Kalyane and Kalyane (1991) Zachos (1991); Gupta, Suresh Kumar and Khanna, (1999); Koganuramath, Angadi and Kademani (2002); Swarna, Kalyane and Vijai Kumar (2002) and Lee (2003). Zainab (2001) compared the perceived adequacy of library resources for research, the formal channels found to be useful in providing information needed for research, the methods used to keep abreast with current research literature, the problems faced when obtaining information required for research with publication productivity of 83 academic engineers and 239 academic scientists from the University of Malaya and National University of Malaysia.

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Sudhier and Abhila (2011) analyzed the research productivity of social scientists at the Centre for Development Studies (CDS), Thiruvananthapuram, during 1998-2008, covering 599 research articles published by the CDS researchers, including 38.23% journal articles, 23.54% chapters in books and 15.03% working papers. Kaur and Aggrawal (2010) brought out the results of a bibliometric study of research publications of Department of Chemistry, Gurunanak Dev University, Amritsar, for the period 2002-2006. Bhatia (2010) studied quantitatively research publications published by the scientists of National Institute of Occupational Health (ICMR) Ahmedabad, India during 2002-2006. Sevukan and Sharma (2010) evaluated the research performance of biotechnology faculties in central universities of India from 1997-2006. The data used for the study were retrieved from two database sources, namely, PubMed, NCBI (National Centre for Biotechnology Information); and ISI *Web of Science* database—Science Citation Index Expanded (SCIE). The results indicate that the growth of literature in biotechnology has steadily increased from 15 articles in 1997 to 43 articles in 2006; two-authored publications predominate the pattern of authorship; applicability of Lotka's law is validated from the values $n = 2.12$, $C = 0.669$, and $D = 0.027$ obtained using least square method.

"Publish or Perish" is often heard in academic environment for better scientific productivity and, in fact, the development of any discipline or visibility of any profession depends upon the tempo of scientific and research output in the form of publications and innovation. Thus, academic and research community serving in educational institutions of higher learning has remained an important yardstick for measuring the impact factor and quality of research. In this direction, an attempt has been made to provide scientometric dimensions of the research faculty and scholars employed in the universities of Karnataka to show their research bent of mind in an academic and research setup.

OBJECTIVES

The main objectives of the study are to include:

- Research productivity of academic and research community working in universities of Karnataka,
- Authorship pattern of research publications
- Domain-wise publications of scientific productivity,
- Year-wise growth of research publications and
- Preference of research communication channel among research community.

METHODOLOGY

JCCC@UGC-INFONET is a gateway to comprehensive collection of subscribed journals under UGC Infonet consortia including open source journals, which includes all the e-publications of the academic and research community in and around the world. JCCC@UGC-INFONET portal has been used to identify the research publications of the faculty and scholars covering period from 1969 to May 2011 at five universities in Karnataka, namely University of Mysore, Mysore; Karnatak University, Dharwad; Bangalore University, Bangalore; Gulbarga University, Gulbarga; and Kuvempu University, Shankarghatta.

Advance search at JCCC@UGC IFONET selecting the field - Author Address and University name given within quotes to retrieve the research publications published by the respective research community covering the subject categories built in is presented in the screen shot.

Limitation of the study

Although JCCC@UGC INFONET covers the entire strata of journals published from national international perspective including e-resources under UGC Infonet programme, all

JCCC@UGC - INFONET
An e-journal gateway to Indian Universities and colleges

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☒ Peer-Reviewed Journals ☒ Professional & Trade Journals

Author address: "gulgarga university" AND Go

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Publication Year From All To All

Journal Type ☐ Open-access Journals

Subject(s) ☒ Subject Categories (Click on + for expanding the subject list)

- ☒ All
- ☒ Agricultural & Biological Sciences
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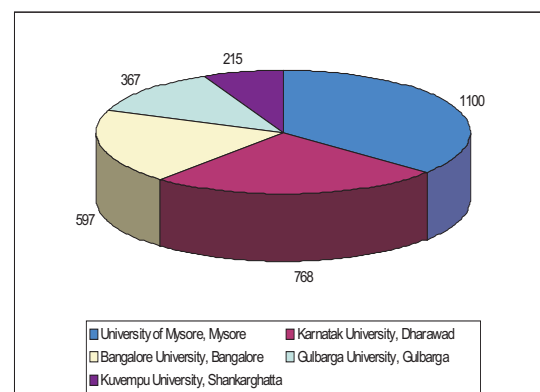
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the journals of Indian origin and few from other publishers might have been left out of there are chances of duplication of articles appearing more than one time in the same search. Hence, the publications of such journals published by the university academic community are not included in the study. Besides, JCCC@UGC INFONET is the only major source based on which the study is undertaken to reveal the scientometric productivity of the universities in Karnataka.

RESULTS AND DISCUSSION

During the span of 42 years, i.e. 1969 to May 2011, the number research publications of the academic community serving or served in the aforesaid universities have been found to be 3047 reported from JCCC@UGC INFONET portal. University of Mysore is the oldest university established in Karnataka has maximum (1100) research publications and correspondingly, Kuvempu University, Shankarghatta, has least publications (215) as seen in Table 1 and Chart 1.

Chart 1: provide legend



Collaborative research has been the order of the day and, nowadays, research is carried out by a group of researchers rather than by a single researcher to a larger extent. Table 2 depicts the authorship pattern of research publications by the research community in universities of Karnataka. It is quite clear that the number of articles contributed by a single author is just 3.93 percent while 1323 articles are contributed by more than four authors (43.41%). 27.69 percent of articles (844) are contributed by two authors and 24.94 percent by three authors (760).

Table 1: Research Productivity of Universities in Karnataka

University	Year of Establishment	Total Number of Research Articles
University of Mysore, Mysore	1916	1100
Karnatak University, Dharwad	1949	768
Bangalore University, Bangalore	1964	597
Gulbarga University, Gulbarga	1980	367
Kuvempu University, Shankarghatta	1987	215
Total		3047

Table 2: Authorwise Productivity

Authorship Pattern	No. of articles	Percentage
Single Author	120	3.93
Double Authors	844	27.69
Three Authors	760	24.94
Four and more Authors	1,323	43.41
Total	3047	100

Table 3: Subjectwise Productivity

Subject/ Domain	No. of articles	Percentage
Chemistry	1153	37.8
Physics	430	14.1
Mathematics	182	6.0
Polymer Science	164	5.4
Biochemistry	142	4.7
Zoology	160	5.25
Botany	95	3.1
Industrial Chemistry	84	2.8
Library & Information Science	77	2.2
Applied Botany	68	2.2
Geology	51	1.7
Food Science and Nutrition	44	1.4
Applied Botany and Biotechnology	41	1.3
Biotechnology	39	1.3
Computer Science	34	1.1
Microbiology	30	1.0
Environmental Science	27	0.9
Applied Electronics	21	0.7
Anthropology	17	0.6
Statistics	16	0.5
Electronics	15	0.5
Biopsychology	15	0.5
Materials Science	23	0.75
Sericulture	11	0.4
Psychology	10	0.3
Education	5	0.2
Other areas	Less than 5	

Research articles published in various subjects have been reported and some of the sub-subjects have themselves grown as independent subjects like Biotechnology, Biochemistry, and Industrial Chemistry etc. Chemistry, Physics and Mathematics dominate the area of research contributions by the academicians in a university set up while Library and Information Science come at 9th position with 77 articles and the rest is shown in Table 3.

Table 4: Yearwise Research Productivity

Year	No. of articles	Percentage
1969	1	0.0
1979	2	0.1
1980	7	0.2
1981	1	0.0
1983	3	0.1
1984	1	0.0
1985	1	0.0
1986	1	0.0
1987	1	0.0
1988	4	0.1
1990	3	0.1
1991	9	0.3
1992	5	0.2
1993	5	0.2
1994	6	0.2
1995	4	0.1
1996	16	0.5
1997	47	1.5
1998	56	1.8
1999	64	2.1
2000	82	2.7
2001	123	4.0
2002	188	6.2
2003	160	5.3
2004	172	5.6
2005	211	6.9
2006	317	10.4
2007	323	10.6
2008	313	10.3
2009	418	13.7
2010	376	12.3
2011 (Partial)	127	4.2
Grand Total	3047	100.00

Table 5: Research Communication Channel

Rank	Scientific Communication Channel	Frequency	Percentage
1.	Journal of Applied Polymer Science	125	4.1
2.	Transition Metal Chemistry	81	2.7
3.	Synthetic Communications	80	2.6
4.	Current Science	58	1.9
5.	SRELS Journal of Information Management	56	1.8
6.	Synthesis and Reactivity in Inorganic, Metal-Organic, and Nano-Metal Chemistry	55	1.8
7.	Molecular Crystals and Liquid Crystals	52	1.7
8.	Bulletin of Materials Science	42	1.4
9.	Archives of Phytopathology and Plant Protection	35	1.1
10.	European Journal of Medicinal Chemistry	33	1.1
11.	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy	32	1.1
12.	Others (Journals with less than 32 publications)	2398	

Although the number of articles published by the research community of universities started in 1969, in 1997 47 articles were published and gradually increased to 188 articles in 2002. More than 300 articles appeared between 2006 and 2010 and 418 articles were contributed in 2009 (Table 4).

Among the various scientific communication journals, the top eleven journals in which most of the articles appeared are shown in Table 5. Journal of Applied Polymer Science ranks top with 125 articles followed by Transition Metal Chemistry (81) and Synthetic Communications (80). In Library and Information Science, SRELS Journal of Information Management takes fifth position and is a preferred medium of publication for articles in the field with 56 articles. Bradford's Law of Scattering serves as a guideline to library professionals in determining the core journals. The law states that journals in a single field can be grouped into three parts, each containing the same number of articles expressed as $1:n:n^2$. A total of 678 scientific journals have been used for research communication by the research

community publishing 3047 articles. According to Bradford's law, one third of scientific journals publish 2409 articles (79%), second onethird publish 411 articles and the remaining onethird has 227 articles.

CONCLUSION

It would be needless to mention that the research articles contributed by the academicians from varied disciplines of universities in Karnataka reveal the qualitative publications, as JCCC@UGC INFONET includes qualitative publications only in the light of the national knowledge commission striving to build knowledge society. This study is an indicator for development covering areas of Science, Social Science and Humanities. In fact, this study would be a simulation for younger generations to emulate and contribute not only as a mandatory but in the interest of development of this discipline and to be in tune with the requirements of national bodies like the UGC.

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