

**A SURVEY OF
THE PATTERN OF LITERATURE SEARCH BY
THE SCIENCE RESEARCHERS OF
KERALA, CALICUT AND COCHIN UNIVERSITIES**

THESIS

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By

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D E C L A R A T I O N

I, Alexander Abraham, do hereby declare that this thesis, ' A SURVEY OF THE PATTERN OF LITERATURE SEARCH BY THE SCIENCE RESEARCHERS OF KERALA, CALICUT AND COCHIN UNIVERSITIES' has not formed the basis for the award of any degree, diploma, associateship, title or recognition before.

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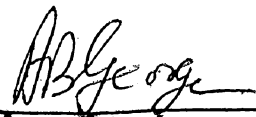
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This isto certify that this thesis is a record of the bonafide research carried out by Shri. Alexander Abraham from 1988 to 1992 under my supervision and that neither this thesis nor any part of the same has previously formed the basis for the award of any degree or diploma.

It is further certified that Shri. Alexander Abraham passed the Ph.D. Preliminary qualifying examination conducted by the Calicut university in 1989.

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Supervising Teacher

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ALEXANDER ABRAHAM

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Chapter I

INTRODUCTION

Literature search is an activity involving the process of matching some specific user needs with relevant literature in a 'pin-pointed' and 'exhaustive' manner. This activity very often becomes complex due to various factors.

1.1 Knowledge and literature

It is estimated that the quantum of knowledge doubles itself in eight to ten years. In certain subjects the growth rate is even faster. This tremendous growth of knowledge is well brought out by the term, 'Knowledge explosion'. This explosion is reflected also in the exponential growth of literature. In 1970 it was estimated that science documents numbered 2 million. In 1985 it was 8 million.¹ Both factors- growth of knowledge and growth of concerned literature- are further complicated by the modern trends of inter-disciplinary as well as highly specialised research which scatter needed literature into many places. This situation makes literature search a highly complex process.

1.2 Bibliographic control

An essential requirement in facilitating literature search by matching the vast knowledge reflected in literature and its varied users is Bibliographic Control. Adequate bibliographic control means that there is complete mastery over the existing literature, pertaining to any subject of search, through appropriate bibliographic tools. Bibliographic control starts from the traditional library catalogue and bibliographies and goes on to many modern tools like computerised data bases and retrieval systems.

1.3 Role of Librarians

Basic need of researchers is literature search. They should have knowledge of the bibliographical tools for literature search. These tools have a wide variety. Indexing, abstracting and reviewing periodicals, cumulative indexes to periodical articles, subject bibliographies, bibliographies of special materials like patents, standards, reports and government/ official documents, are only some of them. Taken together, these bibliographic tools present a complex situation which can hardly be handled by the

researchers themselves, without proper training and experiences in this area.

The active help of library personnel is relevant in tiding over this complex situation. Librarians can help the researchers in two ways. (a) They can share in the researcher's literature search activity. (b) They can also educate the researchers in the methodology of literature search. In either case, there is need for proper communication between the researcher and the library personnel. Krishan Kumar in the light of a survey conducted by him in 1968 stresses the importance of communication between the librarian and the users. ²

Every research involves search for literature. Literature search is an activity involving a systematic methodology and specific skills and is a time consuming job. It cannot be successfully carried out by unskilled and untrained hands. Qualified library personnel are expected to have a systematic education and necessary experience in literature search. Therefore, entrusting the task of literature search to librarians have an economic advantage rather than the researchers themselves trying to do this and wasting their valuable time.

1.4 Division of Work

It has been stated that research comprises of two phases, 'search' and 're-search'. Search corresponds to literature search and 're-search' corresponds to the analysis, interpretation and utilisation of the available information for evolving new theories, making new discoveries, inventions or innovations. These two phases of research require two types of abilities and therefore a division of work between the two sets of experts is possible and necessary to make research more productive and economical. The library experts must take up the 'search' activity and free the subject experts for real 're-search' activity. Such a division of work would be in conformity with the principles of modern scientific management.

1.5 User Education

As a possible alternative to the above division of work and also as a desirable pre-condition for research efficiency of individuals, arises 'User Education'.

'User Education' is a comprehensive term which denotes all the various efforts made by librarians to impart instructions to the user communities so as to develop

in individual users the capability to use libraries and their services to their best advantage. The UNESCO definition of User Education reads, " Any effort or programme, which will guide and instruct existing and potential users, individually or collectively, with the objective of facilitating (a) the recognition of their own information needs, (b) the formulation of these needs, (c) the effective and efficient use of information services, and (d) the assessment of these services. " ³ User Education , with special reference to the researchers, is instructing and training in literature search. The need to educate the user to avoid enormous wastage of resources arising from non-use or under-use of documents in various types of libraries, has been duly emphasized by many, including Krishan Kumar. (1968).

1.6 Background of the study

Research is a cumulative and continuous activity in knowledge production. New knowledge is produced on the basis of knowledge already existing and established in the society. Hence, research involves extensive use of literature that contains the existing knowledge. Libraries are the store houses of literature and therefore of knowledge itself. Under-utilization of libraries in any

particular research situation should necessarily call for detailed investigation as it may cast shades on the soundness of research accomplished there, as well as on the usefulness of those libraries and their services. Further, it can be an indication of the incapability of researchers in finding and using relevant literature and knowledge.

The under-utilization of library resources in the Calicut University by users, particularly by researchers, in the Science faculty, has attracted the attention of the investigator sometime back. Accordingly, in partial fulfilment of the requirements of the Master of Library and Information Science degree, he undertook a preliminary investigation and wrote a dissertation entitled, 'Use of Library Services by the Science Research Scholars of Calicut University: A Survey'.⁴ Closely attached to this he further published three papers. (1) 'A Survey of Library Services rendered to Science Research Scholars by the Calicut University'⁵ (2) 'User education in College Libraries: An outline',⁶ (3) 'Reference service in Calicut University Library: A survey'.⁷ In connection with the above works, and thereafter, the investigator has made use of various studies concerning the different aspects.

of the problem. They include Brember and Leggate (1985), Garg and Ashok Kumar (1984), Gratch and York (1985), Krishan Kumar (1968), Maheswarappa and Prakash (1982), Parkhi (1982), Russel et al. (1987), Subramanyan (1983), Iyengar and Raghavendra Rao (1987), Pookan (1987), Ahsan and Mehia (1967), Sangameswaran and Gopinath (1987), Kawatra (1987), Sethi (1987), Satish and Inamdar (1987), Abraham and Karisiddappa (1986), Abraham (1989), Isaac (1990), and so on.

Extensive reading and review of related literature brought to light the following problems:- (a) the complex and difficult nature of modern literature search (b) the difficulties faced by the researcher in many libraries and (c) the vital importance of user education in promoting the use of literature and libraries.

Difficulties faced by researchers in search and procurement of documents and the benefits of user education having been thus brought into focus, the investigator was prompted to make a more detailed study by expanding the scope of his M. L.I.Sc. thesis to cover the Kerala and Cochin universities also.

1.7 Statement of the problem

The problem pursued in this study was identified as

the pattern of literature search among science researchers in the three universities namely Kerala, Calicut and Cochin.

1.8 Interim Report, June 1989

The investigator, after having secured registration for Ph.D. degree in Library and Information Science from the University of Calicut in June 1988, submitted in June 1989 a written account of research work done until then, for the purpose of his Preliminary Qualifying Examination. This preliminary report mainly contained a review of relevant literature and a report of progress made in data collection.

1.9 Title and Terminology

The title accepted for the study is, " A SURVEY OF THE PATTERN OF LITERATURE SEARCH BY THE SCIENCE RESEARCHERS OF KERALA, CALICUT AND COCHIN UNIVERSITIES ".

The terms in the title have been defined as follows:-

'Pattern' stands for the model of the form, order or ways in which actions generally occur. In the context of literature search it means the habitual way in which users look for and find information and documents.

'Literature' is used to mean collectively all types of reading materials relevant to a subject of study or research, including both published and unpublished items such as books, monographs, articles in periodicals, research reports, standards, patents, conference papers and proceedings, research theses, etc.

'Literature Search' denotes the total efforts on the part of the research scholars to search for the literature of relevance to their work and to gain access to them for reading.

'Science' stands for the totality of subjects and disciplines coming within the scope of the faculties of science in the universities of Kerala, Calicut and Cochin.

'Researcher' when used in a general sense, means a person who has undertaken a systematic investigation of ideas or problems towards increasing the sum of knowledge, through discoveries of new facts, information etc. In the context of the title of this study, 'Researchers' means all those who are enrolled for Ph.D level research, undergoing M. Phil studies and teachers who are engaged in independent research.

1.10 Objectives

The following objectives were formulated for the present study:-

1) To understand the background of the researchers in the science faculties of Kerala, Calicut and Cochin universities.

2) To know how they search for the documents in the departmental libraries and university libraries.

3) To evaluate the sufficiency of collections and services in the departmental, university and other libraries.

4) To understand the document procurement methods at the local and national level.

5) To know ~~the~~ extent of use of translation facilities.

6) To find out the need for user education

7) To get suggestions for the better organisation of the libraries.

With the above objectives in view, the study proposes to investigate the extent of use made by the researchers of the libraries within and outside the Universities, of the various information sources like the library catalogues, bibliographies, indexing and abstracting journals etc., of the existing document procurement facilities including the services of the various national or regional institutions helping in document procurement, and the extent of exposure the researchers have to the methodology

of literature search.

1.11 Research Design Research design consists of the follow

1.12 Hypothesis

The following hypotheses are formulated for this investigation.

1) Research workers are not making the optimum use of the information sources available in the libraries.

2) Research workers are generally ignorant of the various information sources and therefore their literature search leads to waste of energy and time, and

3) More exposure to user educations, will lead to increasing the research worker's efficiency in literature search and document procurement.

1.13 Methodology

The investigator has used the methods and techniques of social survey research for the present study. Survey research allows selection of samples from a large population to obtain empirical knowledge. It also allows generalizations about the characteristics, experiences, beliefs, attitudes, habits and opinions of the entire population under study based on the detailed study of the samples.

Further, Survey Research is still the most widely used research method in Library Science research. A variety of information can be gathered through this method such as the needs of different categories of library users, the various services offered by the libraries, the extent of use made of these services, the satisfaction derived by readers therefrom, and the experiences of library personnel with various types of readers, etc.

The survey tools employed for the present study were (1) questionnaires, (2) personal interviews with researchers and librarians, (3) direct observations, (4) discussions with experts and (5) case studies. The population for the study, as already mentioned is comprised of Ph.D. and post-doctoral researchers, M. Phil students and teachers in the three universities. The sample frames used were the attendance registers of research scholars, M. Phil students and teachers maintained in various departments. A tentative questionnaire was drawn up and a pilot study was conducted in the Calicut university campus. Also the experience gained by the investigator in his earlier study which was conducted for the purpose of the M.L.I.Sc degree dissertation was found useful. The questionnaire

in a final form was later distributed among 576 researchers. Out of these 297 completed questionnaires were duly returned. Samples representative of various categories like teachers, post-doctoral researchers, Ph.D. students, M. Phil students, and researchers belonging to different subjects/ disciplines were taken up for detailed study through interviews, and personal discussions. Twenty five researchers each from the three universities were interviewed on the basis of an interview schedule. The schedule was mainly aimed at checking the correctness of the information supplied by them through the questionnaire responses. In order to understand the utilisation of the collections and services of the various libraries, 25 librarians each from the three universities were also interviewed. These interviews were also held on the basis of a schedule. Another purpose of this interview with the librarians was to verify the information supplied by the researchers. Further, the investigator himself had personal observation of the working of various libraries and the performance of users within these libraries. Discussions were also held with university professors, leading librarians and library science teachers regarding the problems and issues involved in the study. A case study with a population

of 15 researchers was conducted with equal representation to each university to collect additional information for the study. Finally, the data collected were subjected to statistical analysis. Considering the peculiarities of the subject of investigation and the population studied only percentages have been worked out in relation to specific variables. A number of tables have been prepared in order to form due basis for interpretation of the data and to draw useful generalisations. In a few cases, bar diagrams have been used to explain the data.

1.14 Significance of the study

Research is a significant activity of every university. Large amounts are being expended to support research at the university level. One major area in which monetary input to research is occurring is the development and maintenance of university libraries. But it is generally found that university libraries are relatively underutilized. Compared to libraries supporting research in the various specialised institutions, university libraries do not have many of the modern library and information services or the equipments required for such services. Evidently there is much less pressure from the user

communities for better and more sophisticated services than is found in special libraries.

Under-utilization of university libraries by the researchers may be an indication of their inability to utilise the library resources to the best advantage. As every research involves literature search as its essential preliminary, researcher's ability in literature search is one factor which determines the use made of libraries. Therefore it is important to know how far the researchers in the universities have the required skill and experience in literature search. A correct understanding of this will help in devising ways and means of developing in the researchers the required literature search capability. In that perspective, the present study has great significance. It would bring to light what prevents the researchers from using the libraries to the maximum possible extent. It would reveal the extent of exposure the researchers in the science disciplines in these three universities have had to the methodology of literature search. It will also reveal the knowledge of the researchers in these universities about the various bibliographic tools such as subject bibliographies, indexing, abstracting and reviewing periodicals, union catalogues, computerised information systems and databases, and institutions engaged in documentation and information activities.

This would further reveal whether there is a need for a more systematic user education for the researchers. Such new steps and corrective measures would certainly enhance the utility of the materials and services available in these libraries as well as show new directions for the future developments of the libraries in these universities. It has already been pointed out that information explosion, increasing inter-disciplinary research and the emergence of new specialities have put the researchers of today in a very complex situation. No researcher can know about and gain access to all the materials relevant to his own area of specialization without help from the library staff. To save his valuable time, he will have to lean heavily on library personnel. The study will reveal to what extent and in what manner the library personnel can share in literature search and retrieval by the researchers.

1.15 Limitation of the study

This study has the following limitations:-

- 1) It is confined to the three universities of Kerala, Calicut and Cochin. This is because the investigator has been concerned with the performance of the researchers in these universities only and the use they make of the

libraries in these universities.

2) It is limited to researchers in Science departments only because of several reasons. Firstly, it is in science subjects that the importance of information input is more obvious than in Social Sciences and humanities. Secondly, scientific information has more peculiarities like fast growth and changes, scattering, inter-disciplinary emphasis, currency and perishability etc. These reasons make literature search more complex in science subjects.

3) The methods employed being the survey research method, the data collected are prone to subjectivity particularly the data obtained through self administered questionnaire. In spite of these drawbacks, the investigator has taken all precautionary measures to obtain dependable results by crosschecking and verifying the data through interviews, discussions, personal observations, case studies etc. The conclusions arrived at are on the basis of objective analysis within the accepted framework.

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Chapter II

REVIEW OF LITERATURE

The literature in any field is the foundation upon which the whole edifice of knowledge in that field is built. A thorough survey of existing literature is essential to avoid duplication of research and to help in the discovery of new horizons. It will disclose what methods of attack on specific problems have been promising or disappointing and what problems remain to be solved. So a thorough and comprehensive survey of literature of the present field of survey was undertaken. But the investigator did not come across any literature pertaining to the exact research problem undertaken by him as there were no previous study on that other than the studies he himself had done earlier. Therefore his concern was to identify literature closely related to the research in related areas, done elsewhere. In this endeavour he was able to find quite a number of documents particularly those in the area of user studies. The most relevant among the identified literature were subjected to detailed study. These items are broadly categorised and presented hereunder.

- 1) User studies
- 2) Literature search
- 3) Document delivery

- 4) Translation
- 5) Library/Information services
- 6) User education

2.1 User studies

User occupies the key place in the library and information system. User studies are therefore important tools to estimate information requirements of all types of users especially scientists.

The attitude of the users is an essential consideration in the design of library services. Users have their own ways of information seeking which should be accommodated as far as possible although some of them could be changed.

According to Kawatra (1985), in university libraries, user studies are done 1) to identify the levels and kinds of user needs, 2) to know faculty and student priorities for library resources and services, 3) to identify the levels and kinds of user needs, 4) to identify the limitations which discourage the use of the library, 5) to know the level of involvement of faculty and students in the library programmes and 6) to improve the organisation and planning of services at the local and national level. Every user study can lead to re-designing the library system or evolving of new policies.¹

1. Kawatra, P.S. User studies: state of the art, Annals of library science and documentation, 32(3-4), 1985, p. 73-75.

Line (1963) made a survey of student attitude to university library at Southampton university which revealed that women were more likely to use catalogue than men. This survey has also revealed several problems and deficiencies and changes in the library policy. ²

Line and Tidmarsh (1966) revealed some changes in student attitudes which can fairly be applied to new policies. ³

Manzel (1966) reported that as compared to physicists, chemists depend more upon books and less on primary and interpersonal sources. ⁴ Krishan Kumar (1968) conducted a user study through questionnaire and interview methods and it was observed that a majority of the researchers (71%) felt the need to improve the skill in the use of science and technology literature. ⁵

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Peterson (1969) in a study on the pattern of use of periodicals at the University of Michigan revealed that 1) periodicals literature seemed no less important for non-science students than it was for science students., 2) the subject approach to periodicals literature was the dominant approach used by graduate students. ⁶ Wysoki (1969) stated that user studies are concerned with studying information processing activities of the users. His user study was aimed at understanding directly or indirectly their information needs, user behaviour and use pattern by users. ⁷

Important user studies also include, 'A critical review of the surveys of scientist's use of libraries' by A.S. Barber (1966)⁸, 'Use studies: a review of the literature from 1966 to 1970' by Wood (1971)⁹, 'Assessing information needs and uses: A state of the art report' by S.N.Singh (1979)¹⁰

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Various studies regarding user's survey and information gathering habits of scientists carried out in USA and UK include Flowers (1965)¹¹, Chen (1974)¹² and Wood (1973)¹³. Studies by Flowers and Chen were meant to find out the use of research literature in the fields of Chemistry and Physics. These studies concentrated on forms of the literature used, important titles and time spent in information gathering. Wood (1973)¹³ reported about the use of scientific and technical news journals by chemists mainly covering the use of chemical and engineering news. Chen (1974) made a study regarding the use pattern of physics journals in large research libraries. Strain (1973)¹⁴ reported about the use of the library by engineers and their views about the loan period etc. In India, Bhushan (1972)¹⁵ made a study of post-graduate students of IIT, Delhi and sought their opinion regarding various services, adequacy of collection, assistance required in the location of materials, time spent in the library and use of catalogue etc.

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Urquhart and Shofield (1972)¹⁶ conducted two surveys to measure reader's failure at the shelves in three university libraries. The results of these surveys helped the librarian to understand priorities and to reassess book purchasing policies and better understanding of reader's behaviour and problems. Burns and Hasty (1973)¹⁷ conducted a survey of attitudes towards services offered by the Colorado state university libraries. Most user studies stressed the descriptive rather than the analytical aspects in their reporting. Marguire and Lovelace (1975)¹⁸ conducted a survey on the information needs, usage and attitude of medical researchers in Australia and it was revealed that there was lack of adequate collections, insufficiency of trained staff and paucity of mechanism to ensure user awareness of available services.

Recently several user studies have been carried out to study the performance measures of some university libraries in USA and UK. Kantor (1976), Saracavio (1977), Alabi and Alegbelye (1978) made such studies.

16. Urquhart, J.A. and Schofield, J.L. Measuring readers' failure at the shelf in three university libraries, Journal of Documentation, 28(3), 1972, p. 233-41
17. Burns, R.W. and Hasty, R.W. A survey of user attitudes towards selected services offered by the Colorado state university libraries, Fort Collins (Col), Colorado state university libraries, 1973
18. Marguire, Carmel and Lovelace, Eugenia. The information needs of usage and attitude of medical researchers in Australia: strategies for the provision of more effective medical information facilities. Second report to the National Library of Australia, Kensington (Australia, New South Wales University, School of Librarianship).

Most of the studies have concluded as follows,

About 40 to 50% of academic library users were not satisfied in the matter of obtaining what they wanted from the library. The causes of frustration among the remaining 50 to 60% were as follows: 1) A user might be frustrated if the book he wanted was not in circulation.. 2) Cases when a reader could not obtain a book which was neither circulating nor being read in the library. This might be due to wrong shelving.. 3) The book being sought might not have been acquired by the library.. 4) Errors by the users in locating the books on the shelves.

Crawford (1978) reported that by 1977 more than 1000 important studies were conducted on user studies.²⁰ Fernandes (1978)²¹ reported that, "many teachers are either uninterested or not proficient in using the library for promoting the teaching and learning of their students.... The most compelling problem is that of non-use of most of the available book stock. It has been estimated that often as much as 90% of the materials remain unutilised." Eron (1978)²² stated

19. Alabi, G.A. Computerization of library services: The state of the art, Annals of Library Science and Documentation, 31(3-4), September-December, 1984, p. 103

20. Crawford, Susan. Information needs and users', Annual Review of Information Science and Technology, 13, 1978

21. Fernandes, Dominic.A. Administration of the library- Library staff's relations with teachers, students, and principal, New Frontiers in Education, VIII(3), July-September, 1978, p. 22

four steps in the user needs research. 1) hypotheses formation., 2) selection and observation method 3) analysis of observation and 4) interpretation of results. Yadav and Karanjai (1978)²³ conducted a study on the information needs of research scientists at INSDOC. This paper concluded that our scientific libraries were by and large becoming self sufficient in serials literature while the situation with regard to patents, conference papers, dissertations, and technical report literature was unsatisfactory.

(failure rate being 60.85%). Sengupta (1978)²⁴ gave the main shortcomings in meeting the information needs for bio-research planning in India as 1) shortage of reliable statistics about production, demand, cost benefit analysis and market potential. 2) non-availability of comprehensive published information at a central place in India immediately after publication i.e. through airmail service. 3) delay in getting all foreign patent literature in the field of bio-science at a central place. 4) cost factor and delay in getting translated text of papers published in languages other than english. Kennedy (1980)²⁵ tried to explore the

22. Exon, Ardy. Getting to know the user better, ASLIB Proceedings, 30(10-11), 1978, p. 352-64.

23. Yadav, R.S. and Karanjai, Aruna. Meeting the information needs of research scientists - A sample analysis of INSDOC document supply services, Annals of Library Science and Documentation, 25 (1-4), Mar-Dec, 1978, p. 62-67

24. Sengupta, I.N. Information needs for bioscience research, Lib. Sc. 15, 1978, Paper XI, p. 185

25. Kennedy, M.A. Service to older adult users of academic libraries: a study of librarian attitudes, Ph.D. thesis, University of Pittsburgh, 1980

attitudes of academic librarians towards older adult users of the library. Age was found not necessarily a debilitating factor with regard to learning and motivation in adults. Churchlands and Nedlands (1981) ²⁶ surveyed the attitudes of students to their college libraries. Minner-van-Neygen (1982) ²⁷ made a study on attitude of students towards behavioural approach to library and information services. This study revealed that there was significant correlation between sex and level of exposure to the behavioural sciences. Olanlokun (1982) ²⁸ conducted a study to determine the attitudes of the major interest groups in Nigerian universities on library policy, use and service. The findings recommended more interaction with the library users, users' need also should be given more care. Dashmukh (1983) ²⁹ conducted a survey through questionnaire method to evaluate the library resources of the Central Soil and Water Conservation Research and Training Institute, Dehra Dun.

26. Churchlands and Nedlands. Survey of student attitudes of college libraries, Research in progress in western Australia, CRUS News, 1981, p.10, 18
27. Minner-Van-Neygen, Veerle. Students attitudes towards the behavioural approach to library and information science: an experiment involving the group as an agent of change, Ph.D. thesis, University of Pittsburgh, 1982
28. Olanlokun, Simon Olajire. A survey of the attitudes of Nigerian university faculty, students and librarians towards library policy, use and service, Ph.D. thesis, University of Pittsburgh, 1982
29. Dashmukh, G.R. User survey of Soil Conservation Research Institute Library, Annals of Library Science and Documentation, 30 (1), 1983, p. 31-34

This study revealed that the number of users of the library was not much and the various collections of literature were not adequate. Services like selective dissemination of information and current awareness service were to be introduced immediately. According to Hoglund and Persson (1984),³⁰ the information needs and uses among scientists and engineers is of high importance and outlined a programme for user studies with special reference to Sweden. Dhyani (1984)³¹ made a study at Rajasthan university. This study stressed the need for library instruction to users in Rajasthan university library. It also suggested the need for a manual like, 'Know your library' and dissemination of latest information to the faculty. Chievravin (1984)³² revealed the need for strengthening current awareness service in medical libraries, and need for resource sharing among medical and other libraries to meet the needs of the users, at an optimum level. Brember and Leggate (1985)³³

30. Hoglund, Lars and Persson, Olle. Research on the needs and uses of scientific and technical information: research areas and problems. Nordicom Review of Nordic Mass Communication Research, 2, 1984, p. 12-17

31. Dhyani, P. Need for library instruction to readers in Rajasthan university: a survey. UNESCO Bulletin for Libraries, 28 (3), 1984, p. 156-69

32. Chievravin, Penpinol, V. Use of journal literature by bio-medical researchers in the Philippines: a case study using citation analysis. Library Science with a Slant to Documentation, 21 (4), December 1984, p. 227-35.

33. Brember, V.L. and Leggate, P.L. Linking a medical user survey to management for library effectiveness. 1. The User Survey. Journal of Documentation, 41, March 1985,

in a survey made use of semi-structural interview, questionnaire, feedback form, direct observation, reference tracing, and experiment and analysis of library records. The gathering of data about the same library users by several different techniques was a special feature of this study. Gunjal and Naidu (1985)³⁴ conducted a study on the use of journals in an agricultural library. The study included 147 theses having 3875 citations between 1969 and 1984. 55% were found to be journals. The most frequently cited journals were 27 which provided 86% of the total citations. Gupta (1985)³⁵ conducted a study on the use of journals based on issue/use slips of bound and unbound volumes of journals. It was indicated that 99.4% of the users demand could be met in a better manner. Sano (1986)³⁶ made a survey into online information use and potential improvement in library service in the University of Osaka Prefecture Agriculture Department Library. This study made use of questionnaire method and

34. Gunjal, S.R. and Naidu, G.H. Application of citation analysis for journal use study in agricultural extension: a case study, Fifteenth IASLIC conference, 1985, p. 117-20
35. Gupta, R.C. Use as a factor in periodical selection: A statistical case study in SERC library, Fifteenth IASLIC conference, 1985, p. 113-16.
36. Sano, Hiroshi. Information needs of agricultural researchers and online searching: cases of university of Osaka prefecture (In Japanese), Online-Kensaku, 7 (4), Dec. 85, p. 164-71.

65% of the respondents had not used online services, but only 7% of these said that they could not foresee themselves using such facilities in the future. Yates (1986)³⁷ made a study on the information needs of scientists and examined online bibliographic database searching, videotext, video disc, electronic publishing, satellites, cable television and various changes in information gathering habits of users. Sridhar (1986)³⁸ conducted a study on the use of current journals by Indian space technologists. It was concluded that abstracting and indexing journals were little used. The average use of journals, in physics, electronics, science, aeronautics, astronautics, and space flight groups were very high. Maheswarappa and Trivedi (1986)³⁹ stated that user studies are essential in building up needbased resources and in designing appropriate information systems. Blagden (1987)⁴⁰ reported about the users of Fawcett library to gain an insight into the library use made by people working on women's studies

37. Yates, B. Information needs of human beings, Journal of Library and Information Science, 11 (1), June 1986, p. 77-89
38. Sridhar, M.S. Use of current journals by Indian space technologists, Serials Librarian, 10 (3), Spring 1986, p.77
39. Maheswarappa, B.S. and Trivedi, S.K. Information needs of Indian food scientists, a case study of CFTRI, Mysore. Annals of Library Science and Documentation, 33 (1-2), March-June 1986, p. 67-75
40. Blagden, Pauline. Pattern of library use among researchers in the field of Women's studies with reference to the Fawcett library, Women's Studies International Forum, 10 (3), 1987, p. 317-29

d to focus on the use made by the Fawcett library and its catalogue and evaluate the reasons for non-use by those to whom it seemed potentially relevant. Hegg (1987) ⁴¹ made use of quantitative measure of library performance based on outcomes of patron requests at the periodicals service desk. 83% of the sampled patrons were undergraduates. The overall rate of success of the patrons was 90%. All libraries should be in contact with students either in the class room or at the conference desk and should recognise the need to instruct patrons in the use of appropriate indexes and bibliographies for locating information they were seeking for. Russel et al. (1987) ⁴² observed that there was a comparative analysis on the literature citation characteristics of two sets of Mexican research students in veterinary science. This study had proved that notable differences were found in the literature use patterns between student groups and researchers. This was an indication of different levels of competence regarding bibliographic search techniques and knowledge of foreign languages. Ahsan and Mehla (1987) ⁴³

- Hegg, Judith L. Using document availability research in a library self study, Dec. 1987, 19p.
- Russel, Jane M., Mendoza, M., Martinez, G. Pattern of literature citation by undergraduate students and researchers in the veterinary field, Scientometrics, 12 (1-2), July 1987, p. 73-80
- Ahsan, A., Shoab and Mehla, R.D. Problems, needs and approaches of users to information in Agricultural sciences, ILA Bulletin, XXII (3-4), October 1986-March

stated that various user surveys revealed that a researcher on an average spent half of his research time on reading and half of the reading time on retrieving the information. Day and McDowell (1988)⁴⁴ made use of interview method and revealed that all students make use of the library to a certain extent. Most of their courses were highly directed and placed little stress on independent learning or information skills. Pelzer and Laysen (1988)⁴⁵ made a study on the general use of veterinary library at Iowa State University and the library was mostly made use of for studying and for making photocopies of materials. Suchitra Dutt (1990)⁴⁶ observed that due to lack of adequate knowledge of the information needs of the society, information services did not correspond with the needs of users and subsequently remain under-utilised or not utilised at all. Soma Raju (1990)⁴⁷ made a study on the role of university library in research. This was a case study of Andhra University library.

44. Day, John and McDowell, Liz. Information needs of science and technology students, Education Libraries Bulletin, 31 (2), Summer 1986, p. 1-6.

45. Pelzer, Nancy.L and Laysen, Joan. M. Library use and information seeking behaviour of veterinary medical students, Bulletin of the Medical Library Association, 76 (4), Oct. 1988, p. 328-33.

46. Suchitra Dutt. Assessment of user needs for effective utilization of information systems: Current problems and trends in library and information services, edited by M.A. Khan and S.R. Ijari, Varanasi: Indian Bibliographic Centre, 1990, p. 366-67.

47. Soma Raju, P. Role of university libraries in support of research, Visakapatnam: Andhra University Press and publications, 1990, 144p.

This study examined the adequacy of the document collection, library facilities and information services in relation to the needs of research scholars and their expectation from the library. Musib (1991) ⁴⁸ attempted to find out the information needs of cottage industries. The methodology applied was questionnaire cum interview method. The survey revealed that most of the respondents engaged in cottage industries depended largely on self, friends, neighbours, family members, fellow professionals and shopkeepers for their information and most of the respondents were ignorant about the latest technology and relied on their traditional methods.

2.2 Literature Search

Literature search in the special context of science research is an attempt to identify, locate and synthesise all available information on documents relating to completed research and other studies like research reports, articles in periodicals, books and various other materials about the specific problems of the research topic in hand.

The identified literature on literature search reveals discussions on various problems involved in literature search.

48. Musib, S.K. Information needs of the cottage industries: a survey report. CLIS Observer, VIII (1&2), Jan 1991, p. 14-17

the research work on the basis of information gathered from published documents and from discussion with colleagues. This study emphasised that information has a great impact on research and unintended duplication and consequent modification or dropping of projects would lead to wastage of research potential. Therefore, it was necessary to provide the research workers with pin-pointed, exhaustive and expeditious information. Because of these reasons, researchers have to spend considerable amount of time in searching out relevant literature and information.

Bhaker (1979) observed that physicians spent 10.9 hours per week in searching and reading literature. Mehta (1982) also made a similar study. According to him, physicians spend 20 hours per week in searching and reading literature.⁵² Pierce (1986)⁵³ stated that a literature search at comprehensive level is imperative to avoid duplication in research, although such searches are costly and difficult to arrange.

Knowledge of information sources are necessary for accomplishing any successful literature search. Saxena(1986)⁵⁴

52. Dhavan, S.M. and Sashdewa, D.L. op.cit., no. 4, p. 103-111.

53. Pierce, Bryan. E. Computerised literature searches: their advantages and limitations, In J.L. Maclean, L.S. Dixon and L.V. Hoeliles eds.: The First Asian Fisheries Forum, Manila, Philippines: Asian Fisheries Society, 1986, p. 425-27.

54. Saxena, R.S., op.cit., no. 49, p. 70-72.

asserted that the researcher should be made aware of the existing sources of literature in their field of specialisation and that this will help to conserve the research potential by saving a lot of the valuable time, money and energy. According to him, this aspect is mostly neglected by professional researchers due mainly to their ignorance of the sources of literature and the lack of training in handling and using information sources and reference tools during their undergraduate and post-graduate level study. Srivastava (1979) held that a thorough knowledge of the relevant materials in a given field was essential for literature search and therefore every researcher should have acquainted himself with the information sources including encyclopaedias, handbooks, guides etc. He also held that researchers should familiarise themselves with the layout of the documents to be searched and the types of indexes and subject arrangement they have. ⁵⁵

Among materials of great relevance to science researchers, the category known as secondary journals rank high. This includes indexing, abstracting and reviewing periodicals. They give easy access to the primary journals. Sridhar (1986)⁵⁶

55. Srivastava, M.S. Role of secondary periodicals in literature search, International Library Movement, 7 (1-2), 1979, p. 43-48.

56. Sridhar, M.S. op. cit., no. 38, p. 92.

conducted a study on the use of current journals by indian space technologists and he concluded that abstracting and indexing journals were little used. Srivastava (1979) ⁵⁷ also made a study on the role of secondary journals in literature search. He emphasized that scientists who were ignorant of what was known already have little chance of making any worthwhile contribution. The research findings already made are reported mainly through periodicals. But the proliferation of scientific journals make the use of indexing and abstracting periodicals almost indispensable. Colthurst and Shilling (1977) ⁵⁸ pointed out that literature searches were carried out by the researchers themselves in many cases except perhaps in the case of patent literature. But there are many problems that an individual researcher has to encounter while attempting a self search. Normally a researcher should consider the stack of a library as its core unit of searching. But a vast collection creates various problems. Hart (1958) ⁵⁹ said that the reference librarian is the living link between the book stock and

57. Srivastava, M.S., op. cit., 55, p: 43-48.

58. Colthurst, J.P. and Shilling, M.E. Online searching in a research environment, Online Review, 1 (4), 1977, p. 311-17

59. Hart, James.D. Search and research: The librarian and the scholar, College and Research Libraries, September 1958, p. 365-74

the researcher. Rajwant Singh (1977) ⁶⁰ pointed out that the increase in research programmes had created serious problems in bibliographical control of the literature containing information on different scientific matters and developments. Sengupta (1978) ⁶¹ with particular reference to biological research argued for a well planned documentation service headed by an efficient information scientist so that the research personnel could devote most of their time to actual research. Without this the scientists were forced to spend a lot of time in search of information. Eres and Noerr (1985) ⁶² were concerned about the difficulties experienced by researchers in less developed countries in accessing and acquiring primary and secondary literature.

It is interesting to study the search methods employed by researchers of various types. Dhawan and Sachdeva (1987) ⁶³ studied about the users' approach to information in physical sciences. Mansel (1966) ⁶⁴ reported that scientists followed those paths which placed the smallest amount of strain on them in seeking information.

0. Rajwant Singh. Role of documentation in scientific research in India, Indian Library Movement, 4 (2), June 1977, p. 98-102.
1. Sengupta, I.N., op. cit. ²⁴, p. 183-84
2. Eres, Beth Krevitt and Noerr, K.T. Bivins, Access to primary and secondary literature from peripheral or less developed countries, Journal of the American Society for Information Sciences, 36 (3), 1985, p. 184-91.
3. Dhawan, S.N., and Sachdeva, D.L. op. cit. ⁴, p. 107
4. Mansel, H. Formal and informal satisfaction of the information requirements of chemists: Report, Bureau of Applied Science Research, Columbia University, 1966

Blair (1981)⁶⁵ in a thesis submitted to the University of California, Berkely also examined the manner in which people search for information which they know or believed to exist. Literature search has become more efficient and easier due to the introduction of information technology. Szygierski (1980)⁶⁶ pointed to the advantages of new information technology. Kaltwasser (1987)⁶⁷ was scared of the danger of manipulation of information and other disadvantages of information technology. Smith (1987)⁶⁸ made a study on the information station developed at the undergraduate library, Purdue university, Indiana where a microcomputer supported programme was reported to have replaced reference personnel in giving reference service. One of the major possibilities brought out by the new information technology is the online searching facility. Mowat and Cannell (1986)⁶⁹ did a survey of online searching in university libraries and reported that the percentage of libraries offering online services rose from 75-84%. Similarly there was an increase

- . Blair, David Clark. Pragmatic aspects of inquiry. Ann Arbor, Michigan university microfilm international, 1981, 187p.
- . Szygierski, Norbert. Organisational response to changes in information technology. Information Processing, 80. p. 759-65
- . Kaltwasser, Georg. Dangers for the modern information society in the computer age. IFLA Journal, 13 (2), 1987. p. 111-18.
- . Smith, Dana. E. The information station, Small Computers in Libraries, 7 (6), June 1987, p. 26-27
- . Mowat, Ian R.M. and Cannell, Sheila. E. Changes for online searches in university libraries; follow up to 1981 survey, Journal of Librarianship, 18 (3), July 1986.

the number of searches being done at each institution from an average of 161 in 1981 to 214 in 1983. Colthurst and Shilling (1977)⁷⁰ in another study observed that the introduction of online search provided the research worker with larger retrospective search facilities. Online searches in order to become more effective will require on the part of the searcher a thorough knowledge of the information base and its structure in the search system. This point was emphasized by Lawrence et. al. (1974)⁷¹ who have brought it a case for a joint endeavour of the information scientist and the researcher. Chambers (1984)⁷² also has discussed the advantages and disadvantages of online methods.

Literature search is bound to meet with failures unless systematically done. Radford (1983)⁷³ was concerned about such failures. According to him the overall failure rate was 35.9% when the search is directed through the catalogues

1. Colthurst, J.P. and Shilling, M.E., op. cit., no. 58
2. Lawrence, Barbara., Neil, Ben.H., Graham, Margaret. Making online search available in an industrial research environment, Journal of the American Society for Information Science, November-December 1974, p. 364-69
3. Chambers, John. A scientist's view of print versus online, ASLIB Proceedings, 36 (7/8), July-August 1984, 309-16
4. Radford, Neil A. Failure in the library: a case study. Library Quarterly, 53 (3), July, 1983, p. 328-39

d shelves. Taken separately the failure rate at the catalogue is 26.2% and at the shelf 46.1%. Literature archives can be directed through books and journal articles following their bibliographical references and citations. Raisig et al. (1966)⁷⁴ observed that the percentage of books used for bibliographical purposes is small in research usage, though books might fulfill the information needs of social scientists more than of pure scientists and technologists. His view was supported by Van Styvendaele (1981)⁷⁵ who reported that pure scientists and technologists found more references to books in periodical articles who normally look for books in the library only rarely. As far as science search is concerned, periodicals carry the latest information. According to Garvey et. al. (1974)⁷⁶ books were more useful to social scientists in literature search, while journals were used both by physical and social scientists as an equally successful source in obtaining information needed.

- Raisig, L., Miles, Smith., Meridity, Cuff., Renata., and Kilgour, Frederick.G. How biomedical investigators use library books., Bull. Med. Libr. Ass., 54 (2), April 1966, p. 104-107
- Van Styvendaele, B.J.H. University scientists as seekers of information: sources of references to books and their first use versus date of publication, J. Librarianship, 13 (2), April 1981, p. 83-92
- Garvey, William.D., Tomita, Kazuo, and Woolf, Patricia. The dynamic scientific-information user, Inform. Stor. Retr., 10 (3-4), March/April 1974, p. 115-131.

Van Styvendaele (1977)⁷⁷ also showed that for university scientists, the main sources of reference to periodical literature were citations at the end of articles in journals and books.

Literature search in India is often confronted with more difficulties than in developed countries. Achyutha Rao (1977)⁷⁸ while studying about literature search in Medical Sciences suggested for the establishment of an information network system in India on the lines of MEDLARS and MEDLINE. Gupta and Mamak (1988)⁷⁹ who dealt with the facility for the acquisition and dissemination of patent information in developing countries pointed to the services offered by the World Intellectual Property Organisation. (WIPO). WIPO extends its free of charge state-of-the-art search facility for the benefit of

- Van Styvendaele, B.J.H. University scientists as seekers of information: sources of references to periodical literature, Journal of Librarianship, 9 (4), October 1977, p. 270-77
- Achyutha Rao, H.R. Medical literature analysis retrieval system online (MEDLINE). In S. Radhakrishna and T.K.S. Iyengar, ed., Technical information services for developing countries, Bangalore: International Council of Scientific Unions: Committee on Science and Technology in Developing Countries. (ICSU/COSTED), p. 223-37
- Gupta, R.K. and Mamak, I.M.S. WIPO state of the art search programme for CSIR laboratories/ Institutes. In Handbook of Libraries, Archives and Information Centres in India. V6, edited by B.M. Gupta et. al., New Delhi: Information resource centre, 1988, p. 223-37.

in developing countries. Raghavendra Rao (1971)⁸⁰ made a study on the pattern of use and search for documents among specialists with the help of citation analysis, questionnaire and personal interviews. He concluded that liaison and communication between the library and the potential users are inadequate. Lloyd (1988)⁸¹ who studied literature search among medical scientists found that only scientists who were educated in the technique of searching would have better communication with librarians and improved quality of literature search. Birnbaum (1959)⁸² suggested that if the scientists are to be liberated from the increasing turgidity of literature search, they have to be taught how to use the library. This is due indication that user education is a long way to go in enhancing the literature search capability of science researchers.

1. Raghavendra Rao, G.S. Pattern of use and search for documents by specialists: a case study through citation analysis, Questionnaire and Interview, DRTC, 9, 1971, Paper BC, p. 164-89
2. Lloyd, D.A. Scientists and information, how they get it, Bibliotheca Medica Canadiana, 9 (4), 1988, p. 198-202
3. Birnbaum, Henry. The research library and the scholar, College and Research Libraries News, 20 (5), 1959, p. 355-364

2.3 Document delivery

The term, 'document delivery' can be used to describe generally a service aimed at placing in the users' hands whatever materials they ask for. In respect of materials that are not available in a particular library, 'document delivery' also means their procurement from other libraries. Therefore, the term can also be used to describe inter-library loan services aimed at providing materials to users or such methods as would enable the users to get the documents either in full or in part for example through photocopying, microfilming, facsimile transfer, etc. In general terms, no library can be self sufficient in respect of its documentary needs, even in a single discipline. This is specially true in science and technology because of the special nature of scientific research and the volume and complexities of its published outputs. So users will have to do additional references in libraries outside and try to get the relevant materials with the help of his library. In this context, the role of resource sharing needs no over-emphasis.

Resource sharing is a term used in library literature as almost synonymous with library co-operation. Batubo (1988) ⁸³ quoted definition of library co-operation as an activity between two or more libraries to facilitate, promote, and enhance

83. Batubo, F.B. Library co-operation, International Library Review, 20, 1988, p. 517-32

library operations and services to users or use of their resources. His study covered mainly the co-operative activities in Britain and U.S.A. Saxena (1989)⁸⁴ had another vision. Resource sharing means library co-operation where all or part of library functions are commonly shared. He observed that it has got two aspects. (1) The materials covering acquisition, cataloguing, storage, book exchange and preservation of the resources on co-operative basis, and (2) services which include provision of reading materials through co-operation, inter-library loan, book exchanges etc. and technical processing, binding, training the staff in reference and documentation services, SDI and CAS and so on. Moore (1987)⁸⁵ made a historical study from 19th century beginning to the present of the growth and development of corporate libraries. Resource sharing in developed countries have made tremendous progress. They are making use of various electronic delivery systems. We in India, cannot think of adopting such highly developed

84. Saxena, R.S. What, why and how of resource sharing among libraries, Chap. 15, In N.B. Inamdar and L.S. Ramaiah, ed. National policy for university libraries in India: problems and perspectives, New Delhi: Concept Publishing Company, 1989, p. 165-76

85. Moore, Edythe. Corporate science and technology libraries: One hundred years of progress, Science and Technology Libraries, 8 (1), Fall 1987, p. 51-60

techniques at present. Khandwala (1989)⁸⁶ reported that the latest technological aids seem costly in Indian situation. This problem could be solved only through library co-operation, sharing of resources, preparation of library tools, library services etc. Various universities can also co-operate to loan dissertation and thesis collections, official publications of government etc. as a special case. Periodicals are the carriers of modern trends and developments in a specific subject especially in science and technology. Garg and Ojha (1988)⁸⁷ conducted a study on the importance of periodicals and various requisites for a good exchange system. They recommended steps to be evolved in the implementation of the system.

2.3.1 Inter-library loan

Inter-library loan is an age old system of document delivery. But the type of postal system, inadequacy of technology, lack of a common inter-library loan code, the expenses and risks involved and, above all, the absence of

86. Khandwala, Vidyut.K. Resource sharing in Indian university libraries. Chap. 14, In National policy for university libraries in India: problem and perspectives, edited by N.B. Inandar and L.S. Ramaiah, New Delhi: Concept Publishing Company, 1989, p. 177-88.

87. Garg, K.C. and Ojha, S.R. Low cost manual system for the exchange of periodicals, Serials Librarian, 14 (1-2) 1988, p. 89-93.

uptodate Union Catalogues are serious hindrances to inter-library loan in our country. Matsumura (1987)⁸⁸ discussed inter-library co-operation with special reference to interlending and provision of various services to external users and the National Science Information System network. Kennedy (1987)⁸⁹ reported the major trends in inter-library lending and the role of commercial document delivery services. He concluded with a call to introduce new technology for document delivery. Is inter-library service a chargeable or free service? There are two opinions. Library service should be a free service and inter-library loan is only another form of procurement of materials that are presently not available in the stock of the library of the user concerned. Sharma (1986)⁹⁰ asserted that inter-library loan is a necessity due to the limited book budget, but it is practised in India on a very limited basis. Also there is no uniformity in inter-library loan service due to the lack of an inter-library loan code. According to him our academic libraries do not have any good bibliographical tool and it

88. Matsumura, Tamiko. Resource sharing for education and research, Information Services and Use, 7 (2-3), 1987, p. 67-76.

89. Kennedy, Sue. The role of commercial document delivery services in inter-library loan, Interlending and document Supply, 15 (3), July 1987, p. 67-73.

90. Sharma, Ravindra Nath. Indian academic libraries and Dr. S.R. Ranganathan: a critical study, New Delhi: Sterling Publishers Private Limited, 1986, p. 195-96.

is difficult to locate books and periodicals due to the lack of union catalogues, union lists of serials, and online services. In the Indian situation, document supply is limited to inter-library loan and provision of photocopies. Agrawal (1987) ⁹¹ held that there is no organisation at national or regional level to take up document supply in social sciences. The Indian National Scientific Documentation Centre (INSDOC) has taken up supply service in science and technology. National Science Library attached to INSDOC supports document supply service in Science and Technology. The shortage of budget due to the recent devaluation in India has brought libraries into severe crisis in the matter of purchase of documents. Ramaiah (1989) ⁹² observed that no university library in India is able to withstand the increasing needs of research with limited book resources. He added that the materials in Indian university libraries must be linked together and made available to each other as and

91. Document supply in Social Science with particular reference to libraries in Delhi. Chap. 7. In S.P. Agrawal's Social Science information and documentation: search for relevance in India., New Delhi: Concept Publishing Company, 1987, p. 94-104.

92. Ramaiah, L.S. Bibliographical control among Indian university libraries, Chap. 17, In National policy for university libraries in India, edited by N.B. Inamdar and L. S. Ramaiah, New Delhi: Concept Publishing Company, 1989

when the need arises. In this context the need for the implementation of the decision to set up INFLIBNET needs no overemphasis.

2.3.2 New Information technology

There are now improved facilities for providing the needed documents to the researchers, thanks to the latest developments, viz. computerised information storage and retrieval and telecommunication systems. Rapid photocopying facility enlarging microforms etc. are also the result of advances in information technology. Developed countries are making use of several methods of delivery of documents with the help of electronic publishing, telefascimile, transmission viz. satellite, online, videotex, videodisc, telex, teletex, telephone, post, EMail, electronic document delivery etc. Campbell and Stern (1988)⁹³ studied how the conventional systems of document delivery by photocopy was revolutionalised by the high capacity digital optical disc and laser technology. With the advent of improved computing and telecommunications, document delivery has become more efficient. Morton (1987)⁹⁴ in Pacific Northwest Land Grant

93. Campbell, Robert and Stern, Barrie. ADONIS: the publishing process moves on, British Book News, July 1988, p. 490-92

94. Morton, Bruce. Rapid document delivery via. digitized documents: the pacific Northwest Land Grant Universities project, Library Hi Tech, 5 (2), Summer 1987, p. 79-84.

Universities project conducted a study on rapid document delivery with digitized documents. His aim was to provide textual and graphic information instantly with IBM-PC compatible microcomputer to eliminate the slowness of USA postal system. The very objective of libraries is to provide documents demanded by scholars. Agrawal (1987)⁹⁵ reported that the latest developments in information technology and communication system will help to deliver the document with the least delay. He added that we can think of the minimum equipments only. viz. telex, carrier vans, computer system, telephones, photocopies, microfilm/microfiche reader cum printer and so on in the indian situation.

2.3.3 Telefascimile

Telefascimile will speed up the delivery of materials among distant libraries. But it is a costly affair. Boss and Espo (1987)⁹⁶ considered the telefascimile technology as a fast transferring machine of written materials between

95. Agrawal, S.P., op. cit., no. 91

96. Boss, Richard.W. and Espo, Hal. The use of telefacsimile in libraries, Library Hi Tech, 5 (11), Spring 1987, p. 33-42

distant places. Telefacsimile system will improve document delivery. Brander (1987)⁹⁷ conducted a study on the Montana Faxnet Project aimed at statewide document delivery system with telefacsimile. Kaya et al. (1987)⁹⁸ reported that telefacsimile system was a cost effective and efficient system of document delivery over long distances.

2.3.4 Commercial document delivery service

Croneis (1988)⁹⁹ examined the experiences of University of Texas at Austin. He made four pilot studies to investigate the cost effectiveness of commercial document delivery. Baldwin and Dickey (1986)¹⁰⁰ conducted a study on enhancing the research activity at the University of Wyoming library with the article delivery service without the presence of user in the library. In commercial document delivery, the

97. Brander, Linda. The Montana Faxnet Project, Library Hi Tech, 5 (2), Summer 1987, p. 70-75
98. Kaya, Kathryn.K., Bremer, Thomas and Carey, Kjestine. Bulletin of the medical library association, 75 (3), July 87, p. 257-59.
99. Croneis, Karen. S. Serial management and commercial document delivery: one library's experience, Bulletin Florid. Chapter Special libraries Association, 20 (1), March 1988, p. 25-30.
100. Baldwin, David.A. and Dickey, Paul.D. Document delivery service, College and Research Libraries News 47 (11) December 1986, p. 704-707

speed of document delivery will depend on various factors, viz. speed in despatching the requests, method of transmission, request handling system at the document archive, distance from source of supply and method of document transmission and handling routines for the supplied document. Currie (1987) ¹⁰¹ held that there is still time lag in obtaining document not available in the library at Mann Library Cornell university, New York. There was a severe crisis in journal prices and pressure of space problem and budget uncertainty in Texas university, Austin. This situation made Ardis and Groneis (1987) ¹⁰² to consider options to purchase copies of journals articles on commercial document delivery. Commercial document delivery of infrequently used materials is a cost effective method in libraries. Malhan (1988) ¹⁰³ reported that the document supply system in Indian libraries should be improved. He also pointed out the need for uniform rule for exchange of various documents and poor response to document supply

101. Currie, Jean. Document delivery: a study of different sources, Quarterly Bulletin of the International Association of Agricultural librarians and documentalists, 32 (1), 1987, p. 13-17
102. Ardis, Susan.B. and Groneis, Karen.S. Document delivery, cost containment and serial ownership, College and Research Libraries News, 48 (10), November 1987, p. 624, 626-27.
103. Malhan, Inder Vihar. Scientific and technical libraries in India, International Library Review, 20, 1988, p. 387-94.

requests. It is a fact that document delivery is a costly affair. Baldwin and Dickey (1986)¹⁰⁴ evaluated the use of document delivery with questionnaire method. The study revealed that 91% of those who responded would use the service. He concluded that document delivery use will attract new users and provide faculty with needed materials. But every service may have use and non-use by the users. Tannehill (1988)¹⁰⁵ conducted a study on the document delivery services and mentioned the reasons for non-use of social titles by librarians. He analysed 28000 serial titles held by chemical abstracts service. This study revealed a non-use of 40% titles for document delivery. It is worth mentioning in this context the effectiveness of document supply service in India studied by Mujo-Munshi and Karinjal (1988)¹⁰⁶ They revealed the results of a survey to assess the effectiveness of document supply service by INSOC, New Delhi. They

104. Baldwin, David, A. and Dickey, Paul.D. Document service, CERL News, , 1986, p. 704-707.

105. Tannehill, Robert, S. Document delivery services: an important adjunct to ownership of publications, Bulletin Florida Chapter Special Libraries Association, 20 (1) March 1988, p. 38-46.

106. Mujo-Minshi, Usha and Karinjal, Aruna. Document supply service of INSOC: a selective study of user satisfaction, ILA Bulletin, XXIII (4), Jan- March 1988, p. 188-93.

90% of the respondents considered this service as and majority asked for speedy supply of documents. an effective system of document supply, a national document supply system is needed. Malhan (1988) ¹⁰⁷ pointed out that India has established a few national libraries and still they lack an efficient national document supply system.

2.3.5 Universal availability of publication

Dr Ranganathan's Second and third laws i.e. Every Reader His or her Document and Every Document Its Reader be satisfied by the concept of Universal Availability of Publication.

The conventional systems of document delivery is slow and not sufficient. So electronic document delivery systems are of great relevance and importance. Introduction of new technology will improve the speed of document delivery and arrange to supply the document with great expedition.

2.4 Translation

Research is universal in nature. But language is not universal. Language is one of the serious barriers to the nation of scientific and technical information. Venkatesan (1979) ¹⁰⁸ explained the problems of language barrier in

107. Malhan, Inder Vihar., op. cit., 103, p. 387-94.

108. Venkatesan, P. Science and technical translations: their need and organisation, Herald of Library Science 18 (1-2), January-April 1979, p. 93-99

in the dissemination of scientific information and considered translation as the only solution to solve the problem.

A report of UNESCO published in 1959 showed that approximately 50% of the literature is published in languages other than English.¹⁰⁹ 53% of the literature of Food science and Technology is published in languages other than English. (Mann, 1966)¹¹⁰ At least 50% of the world's scientific literature is in languages which more than half of the world's scientists cannot read. Only 33% of the published literature is covered by the abstracting periodicals.¹¹¹ Ghosh and Banerjee (1974)¹¹² stated that it is estimated that one third of the scientific

109. Prasher, R.G. Information communication, language barrier and organisation services, Lucknow Librarian, 18 (4), 1986, p. 133

110. Maheswarappa, B.S. et. al. The foreign language barrier among food scientists in India, IASLIC Bulletin, 35 (1), 1990, p. 35-41.

111. Subbaiah, R. New trends in the academic librarianship of India, Herald of Library Science, 21 (1-2), January-April 1982, p. 35-36.

112. The rise of science-technology libraries in India, Chap.5, In G.B. Ghosh and B.N. Banerjee, Trends of information service in India, Calcutta: The World press private limited, 1974, p. 41-51.

Literature is not readily accessible to our scientists as they are produced in Russia, China and Japan. So translation is needed at the personal level by individual scientists and at the national level. This situation creates a severe problem to scientists in India. Hence the need for translation service in research libraries.

A good information system should acquire all the relevant documents in any language and disseminate the same in a language understood by its users. Guha and Ghosh (1984) ¹¹³ stated that an organised translation service became available in India since the inception of INSDOC. But this service is not adequately developed. Taneja (1979) ¹¹⁴ in a study on the present status of translation services in India emphasised the need for coordination of the existing translation services at national level. He also discussed the development of a National Translation centre for science and technology in India.

113. Ghosh, G.B. and Banerjee, B.N.. Ibid.

114. Taneja, S.K. Translation services, : their organisation and documentation at national level in India, Annals of Library Science, 26 (1-4), Mar-Dec 1979, p. 52-56.

An information system should render translation service to its users for foreign language materials in the following ways

1) Finding out translations of documents appearing in foreign languages.

2) Finding out persons, organisations and services capable to translate materials from foreign languages to a known language

3) Establishing in-house translation facilities from unknown languages to known languages for the users.

Humphrey (1960)¹¹⁵ studied the importance of scientific information services. He asserted that knowledge can be of greatest use only when it is shared and communicated with others. It is not economical to have translation facilities for all unknown languages. It is sufficient to have translation facilities for a few foreign languages which are of keen interest to the organisation. For others, the organisation can depend on external sources such as people and agencies who are professional translators, national and international translation services like Indian National Scientific Documentation Centre (INSDOC) in India, National Translation Centre (NTC) in U.S.A., European Translation

115. Humphrey, Hubert. H. Knowledge is power. In Information retrieval and machine translation. Vol. 3, pt. 1, edited by Allen Kent, New York: Interscience, 1960, p. 1-10.

Centre (ETC) in Netherlands, British libraries lending division (BLLD) in U.K, special periodical translation services like National index of Translations of INSOC, Translation Register Index of NTC, World Index of Scientific translations and list of translations notified to ETC of ETC, BILD Announcement bulletin of BILD commonwealth index of unpublished translation of ASLIB index translationum of UNESCO, and various international abstracting and indexing services which provide comprehensive coverage of scientific and technical literature which are published in various languages.

Rajwant Singh (1977) ¹¹⁶ observed that there is no coordination between agencies responsible for technical translation service to avoid duplication of efforts. There should be co-operative efforts among scientific and professional translators to pool together their resources and services thereby establishing translation banks for economy and to avoid duplication in our translation potential.

Saxena (1984) ¹¹⁷ expressed the view that some important translation indexes in Science and Technology are published

116. Rajwant Singh., op. cit., no. 60

117. Saxena. Translation indexes in science and technology, Annals of Library Science and Documentation, 31 (1-2), March-June 1984, p. 32-37.

in India and abroad and explained salient features and drawbacks of world transindex, translations register index, BILD announcements bulletin, Aslib index of unpublished translations, National index of translations etc. Efforts are being made for machine translation. But the cost of translation is quite beyond the capacity of many small information systems in the world.

2.4.1 Problems in science and technology translations

According to Sable (1981) ¹¹⁸ the following are the major problems with respect to translations of science and technology literature.

- 1) The bibliographic 'maze' and how it might be improved, in order to reveal the existence and location of translations.
- 2) The ignorance of foreign language on the part of scientists.
- 3) The tracing of translation and the library's role in facilitating translation.

Anderson (1975) ¹¹⁹ believed that most scholars do not know the existence of the National Translation Centre's Centre's Translation Register-Index. He suggested the

118. Sable, Martin.H. Translation., In Encyclopaedia of Library and Information Science, edited by Allen Kent etc. v. 31, New York: Marcek Dekker, 1981, p. 124

119. Anderson, James.D. Adhoc English language translations A preliminary assessment of their influence on citations
 ... (Delft)

inclusion of translations in English in the abstracting and indexing services in each discipline.

2.4.2 Role of library in facilitating translation

A library should keep information about translation pools and centres, professional associations, government agencies, commercial publishers and their products, directories of translators and translation firms. The library should maintain those published sources on an up-to-date basis. It should assist clients in identifying institutions holding the needed translations. Further it would be a good thing if library staff members are able to translate, abstract or make summaries of materials needed in translations, at least in a few dominant languages.

2.4.3 Science and technology libraries and translation facility

Chosh and Banerjee (1974) ¹²⁰ conducted a study on the science and technology libraries in India. Translation is needed by individual scientists at national level.

Swamy (1986) ¹²¹ stated that the translation services of scientific and technical literature was started by INSDOC in India. INSDOC offers- (1) responsive translation service for foreign languages into English and from English

120. Chosh, C.N. and Banerjee, B.N., op. cit., ¹¹²

121. Swamy, C.N.N. Translation services in India, Chap. 54, In Handbook of Libraries, Archives and Information Centres in India, edited by B.N. Gupta et. al., p. 795-800.

to foreign languages. (2) anticipatory translation service (a) russian science digest service (b) current list of russian scientific periodicals and (3) national index of translations. INSDOC acts as our main source for supplying translation on request in India. However, there is acute shortage of competent translators. Venkatesan (1979) ¹²² mentioned the need for the establishment of a National Centre for Translations as an agency for bibliographical control and coordination activities of translation in India. Johanson (1987) ¹²³ stated that a good talent for languages, good writing and communication skills in two or more languages, an innate curiosity, liking and thorough understanding of scientific disciplines, etc. make a professional technical translation. The translating profession has undergone many changes with the application of computer. With the appropriate software, the translator can create and store online his or her own dictionaries in several languages. Also computer aids for translators are being developed. Another sophisticated option offered by

122. Venkatesan, P., op. cit., no. 108

123. Johanson, Astrid. Translator: a career in scientific and technical information service, Science and Technology Libraries, 7(4), Summer 1987, p. 11-16.

the computer is machine translation. It has added new avenues for translators. Machine translation is likely to prove a very useful as well as cost-effective tool in the future.

2.5 Library / Information service

Any university library should normally render the following services.

- 1) Book lending
- 2) Book consultation
- 3) Periodicals consultation
- 4) Reference service
- 5) Bibliographical and documentation services
- 6) Reprographic services

Chan Del and Saraf (1983) ¹²⁴ studied the genesis and concept of library service. They added that information service is extension of library service through mechanical devices. Library service should be given in the right time so as to promote research activities. Neelameghan (1968-70) ¹²⁵ conducted a study on the role of library

124. Chan Del, A.S. and Saraf, Veena. Conceptual and definitional approach to information and information science, Herald of Library Science, 22 (3-4), July-October 1983, p. 189-200

125. Neelameghan, A. Education, research and library services, Timeless Fellowship, 5 & 6, 1968-1970, p. 53-68

services in promoting research and explained the need for library service in libraries. Dunlap (1976)¹²⁶ in a study of the graduate community in the University of Michigan discussed the problems and needs of graduate students and the special programmes provided by a library to meet the users' needs. Every researcher or user should have an awareness of the available services in a library. Kyumik et. al. (1987)¹²⁷ discussed the services like answering of queries, compilation of bibliographies of recommended literature, provision of information to university staff doing research, compilation of indexes to literature on selected subjects and provision of information education etc. Wang (1987)¹²⁸ felt that information and reference work

126. Dunlap, Connie. R. Library services to the graduate community: the University of Michigan, College and Research Libraries, 37, 1976, p. 247-51

127. Kyumik, M.A., Must, Y.P., and Ermel, M.A. Bibliograficheskie informirovaniye v vysshei shkole (Bibliographic information services at a higher educational establishment), Sovet-skaya Bibliografiya, 4, 1987, p. 39-44

128. Wang, Liangchao. The library and information undertakings being faced with various challenges. (In Chinese) Tushu Qingbao Gongzuo, (Library and Information Science), 1, 1987, p. 10-13.

will make substantial contribution to the development of society. A librarian should act as a guide and 'helping hand' among researchers. Moon (1986) ¹²⁹ stated that the librarian must work with the researchers and keep a little ahead to ensure that their needs are met well. Reference service is the personal service rendered to the users in getting their documents or information in an exhaustive, and expeditious manner. A reference librarian should teach the researcher about literature search also as a means of equipping him for self-help. Horn (1974) ¹³⁰ reported that in a typical reference encounter, neither the librarian nor the user knows what to expect of each other. He stated that Librarian is willing to help the researcher. But the researcher is not seeking help and is uncertain about the ability of the librarian to help him.

Inter-library loan service is intended to supply the

129. Moon, Brenda. E. Cooperative networks and service to the scholar: university library resources for online search, British Journal of Academic Librarianship, 1 (1), 1986, p. 41-52

130. Horn, R. Why they don't ask questions, Research Quarterly, 13, Spring 1974, p. 125-33.

readers with the required materials, that are not available in the library by procuring them on loan from another library. Birnbaum (1959) ¹³¹ emphasized the need for increased specialisation in acquisition. He stated that this will help to reduce duplication of books in a research library and that the librarian should help his patrons by guiding them to locate materials instantly with confidence. A librarian can serve the researchers better if he is a subject specialist himself possessing a scientific background. Somerville (1986) ¹³² stated that a science librarian should possess an understanding of information needs of scientific community, strong communication skills to promote interaction with faculty and know information services such as answering reference queries, computer searches, current awareness service, document delivery and information instruction programme. These qualities in a science librarian will enable him to help the researchers in science and technology much better.

A more recent and intensive form of reference service is Selective Dissemination of Information.(SDI). SDI service

131. Birnbaum, Henry., op. cit. p. 353

132. Somerville, Arlenn.N. Information services to the academic scientific community in 1980's. Reference Librarian, 16, Winter, 1986, p. 125-39.

is meant mainly for researchers. John (1979)¹³³ surveyed the development of SDI and its importance in the intellectual support of scientists. He also listed various steps involved in SDI services. Mauerhoff (1974)¹³⁴ also examined SDI in its historical perspective, the purpose of SDI, SDI overview and so on. Proper matching of information will provide actual information in time to potential users. Joshi (1986)¹³⁵ traced the problems faced in the organisation of the scattered pieces of information. According to him SDI service will help to save the time of the specialist and bring scientific information to him at a reasonable cost. Davison (1974)¹³⁶ stated that SDI service is having theoretical advantage over conventional means of dissemination and avoids the need to access the whole literature for a specialised discipline.

133. John, P.I. Selective dissemination of information, Library Herald, 17 (1-4), April 1975- March 1979, p. 26-37

134. Mauerhoff, George.R. Selective dissemination of information, In Advances in Librarianship, edited by Melvin. J. Voight, 4, New York: Academic Press, 1974, p. 25-53.

135. Joshi, P.G. Selective dissemination of information (SDI): a modern method to suit the present pressing information needs, In B.S. Panwar and S.D. Vyas: Library Management, Delhi: B.K. Publishing Corporation, 1986, p. 319-334.

136. Davison, P.S. Selective dissemination of information, past, present and future development of SDI in the long march to becoming a major dissemination of scientific information, Research in Librarianship, 25 (5), January 1974, p. 5-23.

Dougherty (1971) ¹³⁷ asserted that the librarian should give traditional and non-traditional services such as SDI, retrospective literature searches and so on.

Various forms of Current Awareness Services (CAS) have also to be given to researchers in time to speed up their research activities. Joshi and Narayana (1972) ¹³⁸ listed the following characteristics of CAS. (1) It could be in the form of abstracts, index entries of titles, reports, thesis patents or the reproduction of title page., (2) There should be speed of informing them., (3) It is not meant to answer the specific search questions., (4) It should give a glance through the literature in a broad subject area, etc. Chievnavin (1984) ¹³⁹ stressed the need to strengthen current awareness service in the medical library and the need for

137. Dougherty, Richard.M. Unserved academic style, American Libraries, 2 (10), November 1971, p. 1055-58

138. Joshi, Meera.G. and Narayana, G.J. Current awareness service- What it is?, Annals of Library Science and Documentation, 19 (4), Dec. 1972, p. 181

139. Chievnavin, Penpimol. V., op. cit., no. 32, p. 227.

resource sharing between medical and other libraries.

Documentation definitely helps a researcher to know the trend of development of his specialization. Khurshid (1984) ¹⁴⁰ held the abstracting services and the standards to formulate abstracting work and general rules of abstracting and steps to be followed in this work.

A university should plan improved library services for scientists. Jahoda (1967) ¹⁴¹ added that university should provide the scientists with the following services. (1) assistance while keeping up with literature. (2) index to books being written by the scientist., (3) directory of intellectual resources on campus, ' Who knows What directory '., (4) directory of equipment in various laboratories on campus and (5) index to seminar papers, manufacturers catalogues and other materials. Dunlap (1976) ¹⁴² reminded that users should be given training in effective

140. Khurshid, Anis. On abstracts and abstracting. INICAE, 3 (2), Sep. 1984, p. 113-24.

141. Jahoda, Gerald. Planning improved library services for scientists in universities, College and Research Libraries, 28 (5), 1967, p. 343-46.

142. Dunlap, Connie. R., op. cit., 126, p. 249.

methods of using library resources to continue independent research. They are, (1) computerised channels, (2) slide presentation to help the use of catalogues, (3) basic indexes and union lists, (4) bibliographic instruction, (5) knowledge of indexes, abstracts, patents, standards, government documents and technical reports. Library services should be of greater importance in helping the users of the library. Deshpande (1980) ¹⁴³ pointed out other services such as (1) audio-visual aids, extension services, assistance to college libraries, reduction in postal rates, orientation of freshmen, course in research methodology, book exhibition and so on. In a university library there should be direct contact between the user and the subject specialist librarian. Michalak (1976) ¹⁴⁴ stressed that a librarian should have close contact with the user groups in the selection of materials and collection development, in giving instructions in library use, in the provision of current awareness services, reference service, bibliographical service etc.

143. Deshpande, K.S. University library services for a developing society, ILA Bulletin, XIV (1-2), January-June 1980, p. 10-18.

144. Michalak, Thoma. J. Library services to the graduate community: the role of the subject specialist librarian, College and Research Libraries, 37, 1976, p. 257-65.

The National Centre for Science Information (NCSI) had been set up by UGC at the Indian Institute of Science, Bangalore in 1984. It aims to offer upto date, computerised information services to the faculty members and researchers in the indian universities and colleges free of charge. 145

The provision of library services in the indian situation is worth studying. Tejmurthy (1985)¹⁴⁶ made a study on library services in Madhya Pradesh universities. He added that many of the difficulties were due to lack of qualified personnel and a low priority is attached to the library programme in the overall development plans of the universities. The most important thing is that the available information services should be used very well. Malhan (1988)¹⁴⁷ found out that even the existing resources and services remain underutilised. He added that wasteful duplication

145. Information services to researchers in universities, University News, XXVIII (46), 12, November 1990, p.14

146. Tejmurthy, A. Library services in Madhya Pradesh universities, Library Herald, 23 (4), January 1983, p.

147. Malhan, Inder Vihar., op. cit., 103, p. 387-94.

was taking place due to piecemeal development and effort and the available resources are in an uncoordinated state. There is wide disparity between scientific libraries in our country. Malhan (1988) ¹⁴⁸ further added that some libraries of scientific laboratories use international data base. One library may have a computer terminal and another may not have even a kardex. Some other laboratories still adopt closed access system. The library services should have relevance to the social requirements of Indians. Mitra (1982) ¹⁴⁹ examined the concept of library service in detail and studied the library scene in India in its social context and the library services in India.

The advances in information technology have their effect in improving library services in various libraries. Audirac and Beaulieu (1983) ¹⁵⁰ studied the increasing role that agricultural scientists have to play in the production and dissemination of agricultural information. The preservation of documents in paper form creates severe

148. Malhan, Inder Vihar., Ibid.

149. Mitra, Tarun Kumar. New dimensions of library service Herald of Library Science, 21 (3-4), July-October 1982, p. 182-96.

150. Audirac, Ironne and Beaulieu, Lionel. J. Computer R&D in agriculture: a comparative analysis between a case study and a national sample of agricultural scientist. Institu Food and Agricultural Scientist, Inst. Food and Agricultural sciences U Florida, Gainesville Rural Sociological Sociological Society (Association paper), 1988.

space problem. Frieder (1987) ¹⁵¹ examined the microfiche revolution in libraries. Libraries are becoming increasingly aware of the deterioration of their collection and turning to microforms as a means of preservation. The developments in telecommunication technology also have enhanced the mode of rendering services in libraries in India. Srinivasan (1987) ¹⁵² surveyed the development of computer communication network development and expressed the need for a nation-wide data network for quick transfer of information. The application of computer and its other forms made the search of information more speedy. Kaul (1986) ¹⁵³ asserted that most modern scientists are aware of the existence of computerised data-bases but only a small fraction uses them. He also discussed the advantages and disadvantages of online searching. UNISIST and its feasibility study as a world science information system was explained by Wysocki and Tocatlian (1971) ¹⁵⁴

151. Frieder, Richard. Microfiche revolution in libraries, Microfiche Review, 16(3), Summer 1987, p. 214-16

152. Srinivasan, R. Data network for India, Library Science with a Slant to Documentation, 24 (3), Sep. 1987, p. 150-72

153. Kaul, B.K. Information retrieval, IASLIC Bulletin, 31 (2), 1986, p. 43-49.

154. Wysocki, A. and Tocatlian, J. World science information system necessary and feasible, Unesco Bulletin for Libraries, 25 (2), March-April 1971, p. 62-66

Lazar (1983) ¹⁵⁵ conducted a study on the role of United Nations in information development and gave findings of the United Nations Conference on Science and Technology for development. He concluded that international information systems and networks can be effectively used by a country only if adequate national information infrastructure has been built up. Balakrishnan (1986) ¹⁵⁶ examined the history, origin and structure of the subject classification scheme of International Nuclear Information System (INIS) and explained the INIS thesaurus, input standards and the various products and services generated by the system.

2.6 User Education

The role of the library as an agency for supporting research especially in science and technology need not be overemphasised. Huge amounts of money are spent on developing and maintaining libraries. Unfortunately use of

155. Lazar, Peter. International Information system, INICAE, 2(2), September 1983, p. 34-71

156. Balakrishnan, M.R. INIS: a computer based international nuclear information system, Information Service and Use, 6 (2-3), 1986, p. 73

libraries to the fullest extent is not made by the majority of the users.

Various factors responsible for the non-use of libraries are stated by Seetharama (1972) ¹⁵⁷ as follows:-

- 1) Bewilderment at the vastness of the document collection.
- 2) Ignorance of systems and services
- 3) Scatter of information
- 4) Seepage of information
- 5) New forms of records
- 6) Psychology of users
- 7) Psychology of interest
- 8) Psychological complex of an individual
- 9) Lack of time, poor reading ability, availability of reading materials from other sources, inconvenient location of libraries, size of the library and the standard of library services etc.

Most of these problems can be solved if reader orientation programme is practised properly. Wood (1970) ¹⁵⁸ stressed that proper exploitation of information and the

157. Seetharama, S. Orientation of users: prospects and problems, DRTC Seminar, 10 (pt2), 1972, p. 326-46

158. Wood, D.N. Training scientists and technologists to handle information, (International Congress of Documentation), (Buenos Aires), 1970, Paper II, 10.

subsequent communication of information is the duty of the library and information world and not of the specialists.

User education should be given at different levels such as school students, undergraduates, post-graduates, researchers and professionals. Gunjal and Asundi (1984) ¹⁵⁹ stated that user education is necessary in college libraries. User education helps in the search for information which is part of traditional and conventional task of research activity. Isaac (1978) ¹⁶⁰ in a study on college libraries suggested that the fresh students of colleges should be given orientation courses and short courses of instruction in library use to use the library from the beginning of their college career. Post-graduate students should be offered courses with special emphasis on the use of bibliographies and other tools for advanced learning and research. Vyas (1986) ¹⁶¹ quoted Eswara Reddy (D.S) from his paper, 'Promoting the use of Agricultural library information service through user education in India: (paper presented at the seminar on international

159. Gunjal, S.R. and Asundi, A.Y. User education and training, Herald of Library Science, 23 (1-2), January-April 1984, p. 16-23.

160. Isaac, E.A. What are college libraries and what can they be? : A blue-print for action, New Frontiers in Education, VIII (3), July-September 1978, p.11

161. Vyas, S.D. User education in academic libraries in India, Herald of Library Science, 25 (3-4), July-October 1986, p. 180.

developments and user studies and user education. Hyderabad, Department of Library and Information Science, Osmania University, 22 June 1985) that the user education should start early in the high school stage. But unfortunately, they are absent even at the undergraduate and the post-graduate levels. Sharma (1986) ¹⁶² observed that except in a few institutions, there is no provision for library instruction in colleges and universities. So the users are not able to use libraries effectively. Yakoubi (1987) ¹⁶³ examined the various methods used to keep users informed, and training courses for the library staff, the teaching staff, researchers, and the students. Satyanarayana (1988) ¹⁶⁴ added that the basic component of a library are documents, user and librarian. The documents and the information

162. Sharma, Ravinder Nath. Indian academic libraries and S.R. Ranganathan: a critical study, New Delhi: Sterling Publishers Private Limited, 1986, p. 197.

163. Yakoubi, Bechir. User education at the Oram University of Science and Technology, IATUL Quarterly, 1 (1), March, 1987, p. 63-67.

164. Satyanarayana, N.R. ed. User education in academic libraries, New Delhi: Ess Ess Publications, 1988, 296p.

contained in them are not being fully used by the users. They face certain obstacles in collection of information such as (1) the exponential growth of literature, (2) the complexity of subjects and, (3) the variety of documents and their formats. So the users have to be educated to help for themselves to overcome these difficulties.

Warren (1987) ¹⁶⁵ described a structured exercise used to orientate new students to the library at Riverina-Murray Institute of Higher Education, New South Wales. Saxena and Mehta (1987) ¹⁶⁶ suggested short term training course on translation indexes and use of foreign language scientific and technical literature by Indian scientists. Emphasis should be given for all aspects to locate the needed translation in the orientation programme for translations. This points to the need for user education in scientific libraries. Stickland-Hodge (1987) ¹⁶⁷ emphasised the

165. Warren, Dennis. User orientation in college library. Australian Academic and Research Libraries, 18 (4), December 1987, p. 203-208.

166. Saxena, Suresh Chandra and Mehta, Surendra Nath. Need for user orientation on translation indexes for indian scientists, IASLIC Bulletin, 32 (2), 1987, p. 81-88.

167. Stickland-Hodge, B. Orientation and training of pre-clinical medical students in the use of library. Health Libraries Review, 4 (4), Dec. 1987, p. 238-43.

importance of library instructions for medical students. Chan Del and Saraf (1990) ¹⁶⁸ recommended that the academic librarian should involve in library instruction programme seriously. But no steps have been taken by the academic librarians in the field of instructional programme so far in India. De-cunha (1986) ¹⁶⁹ analysed the need for user education in the university library environment as well as major problems related to the subject. Kawatra (1983) ¹⁷⁰ stressed the need to educate the members of each institution on the use of its library and search for information to increase effective utilization of library. Such (1987) ¹⁷¹ reported on an interview

168. Chan Del, A.S. and Saraf, Veena., Teaching role of academic librarians: fact or assumption, In Dimensions of library and information science, edited by Velayu Venkatappaian., Kaula Festschrift, New Delhi: Concept Publishing Company, 1990, p. 46.
169. De-cunha, Murilo. Bastes S Biblioteca Universitaria a educao do usuario. (The University library and user education), Revista de Biblioteconomia de Brasilia, 14 (2), July-December 1986, p. 175-188.
170. Kawatra, P.S. Teaching the right use of library. Hindu Madras, 1983, Oct. 25, p. 19.
171. Such, Marie-France. Les reaction de la base. (Basic reactions), Bulletin Des Bibliothèques de France, 32 (3), 1987, p. 233-34.

with the Head of the Science section of a French university library that students get some training in information search and tend to rely chiefly on secondary sources and rarely consult primary literature. Vyas (1986) ¹⁷²

noted that the existing libraries have not been fully utilised because of the wide gap between the kind of required information and the kind of information available.

This points to the need to educate the clientele on the use of existing information systems and the structure of available literature in a general way. Ruth Alston, ¹⁷³

a librarian of the Cambridge university has observed, "The stock of indian libraries was significantly underused

because of user ignorance and many thought that the information profession has not on the whole, succeeded in projecting a good image of its capabilities. Abraham (1988) ¹⁷⁴ stated

172. Vyas, S.D., op. cit., 161

173. User education for information seeking. In S.P. Agrawal, Development of documentation in Indian Social Science Information, New Delhi: Concept Publishing Company, 1989, p. 59-65.

174. Abraham, Alexander. User education in college libraries: an outline, paper presented to the National Seminar on College Libraries held at Delhi by ILA during 31 October and 1 November 1988, p. 167- 72.

that underutilization of the existing resources could be solved only through user education. Further it is concluded that proper user education programme could help to make optimum use of the library and information centres. Neelameghan (1985) ¹⁷⁵ asserted that in many developing countries, there is underuse of information sources and services. This is due to lack of understanding of information marketing, user education and user orientation efforts. Vyas (1986) ¹⁷⁶ stressed that user education can be of individual orientation or group orientation. The initiation of students should be made a compulsory activity. He also recommended that user education should form part of library science courses. The librarian should be asked to teach user education at school, college and university level.

Tripathi (1984) ¹⁷⁷ reported that at an All India Workshop on, 'Library services as an aid to higher

175. Neelameghan, A. User orientation in library and information studies curriculum: Some aspects with special reference to developing countries, Journal of Library and Information Science, 10 (1), June 1985, p. 53-65

176. Vyas, S.D., op. cit., ¹⁶¹

177. Tripathi, S.M. Library services as an aid to higher education and research, Herald of Library Science, 23 (1-2), January-April 1984, p. 66.

education and research in pure and applied science" held at Gwalior (M.P) on 24-27th October 1983, the following resolutions on user education were adopted.

The workshop feels a greater need for user education programme in support of teaching and research in college and university libraries throughout the country. (2) Also recommends the development of instructional aids consisting of manual guides and audio-visual materials., (3) User education programme to be developed on a large scale. The U.G.C. and other agencies should provide financial support to the university, college libraries and to the department of library and information science., (4) The library and information science department should undertake training of the professionals in the area of user education.

User education helps to increase the use of available information services. Studies reveal that in the absence of user education, libraries may not be utilised at all or may remain underutilised. User education enables the user to identify and formulate his needs and to match them with the library resources. User education brings the users and information closer to each other. The time saved by the librarian can be used in search and provision of more information. 178

Tripathi (1984) ¹⁷⁹ continues to report at All India workshop on Library services as an aid to higher education and research in pure and applied science held at Gwalior (M.P) on 24-27th October 1983. A.K. Verma stated that orientation programmes are to be directed to under-graduates, post-graduates and research scholars and academic staff. R.S. Saxena emphasised that instruction on the use of library would result in better use of library resources. S.M. Mahajan stressed the need for acquaintance with the relevant literature in the library and with preparing bibliographic and documentation entries, notes and theses. There is also lack of proper emphasis on systematic literature search and the choice of the topic. A.A.N. Raju stressed that there is lack of emphasis on bibliographic entry in research methodology. It is better to evolve a course that could be a combined effort of the faculty and the library. V.V. Kulkarni decried the lack of user education in the syllabi and over emphasis on examination and lecture method for conferring degrees. A user programme should develop hunger for knowledge and familiarity with the library tools and resources so that information acquisition is faster. Library is an agency to which users look for assistance to meet their information needs.

179. Tripathi, S.M. op. cit., no.177, p. 62-67.

So the researchers must be oriented to the available facilities. Orientation programme helps to (1) to get familiarised with the physical layout and procedures for use. (2) to make aware of the availability of staff to help them. (3) to inform users about basic library holdings, records such as catalogues to locate available materials.

User education should start from the school level. Students should be given library assignments to inculcate the habit of reading. At undergraduate level, bibliographic instruction should be given more importance and at post-graduate level a training in manual and computerised literature searching and report writing should be given importance. We lag behind developed countries to acquaint users with user education.

Information technology is applicable in various libraries such as computer technology, telecommunication, audio-visual technology and graphics technology. It includes use of computer, data base, online access and so on. The latest technologies help to cover wide range of information sources, quick awareness, reporting, notification of current developments, interaction among peers, peer groups etc. through electronic system, teleconferencing etc. Thus new technology raises several new issues for the researcher.

Krishan Kumar (1984-85) ¹⁸⁰ asserted that researchers should be given library orientation and bibliographic instruction to help users to become effective library users. Fang and Callison (1990) ¹⁸¹ observed that a large number of current library users are not familiar with library resources. Most of the users do not know how to find out materials they need for research. It is also estimated that 83% of the current users felt it was difficult to obtain key information. A user needs information very precisely. The user who has adequate knowledge of the holdings could find the library sources useful. Pawan.K. Gupta and Usha.K. Pawan (1986) ¹⁸² suggested that user education should be supplemented by employees training and staff orientation. There should be training course for the untrained staff and a refresher course for those trained earlier. The library users should be offered a regular orientation programme. Thus the libraries and information centres can achieve their objective of information dissemination in an efficient and

180. Krishan Kumar. User education, organization, methods of instruction and evaluation, ILA Bulletin, xx (3-4), Oct. 1984- March 1985, p. 85-98

181. Fang, Ping and Callison, Daniel. User education in academic libraries of China, International Library Review, 22, 1990, p. 95-103.

182. Promoting library use through user education programme: a case study of the Jaipur Information Centres, Chap.18, In Pawan.K. Gupta and Usha.K. Pawan., Jaipur: RSSA Publishers, 1986, p. 176-80.

effective manner with the help of user education.

At present, the students are even able to finish their education without ever visiting the libraries. It is not fully realised that libraries are an integral and essential part of the educational system. The purpose of education is to equip the students with knowledge and skills. The teaching and instructional methods should lay emphasis on wider reading and reference by the student community. There should be mutual understanding between the teaching community and the libraries in chalking out programmes for the greater use of library resources. Dougherty (1971)¹⁸³ stated that the librarian must place more stress on user oriented services. Krishan Kumar (1985)¹⁸⁴ suggested that in Indian condition user education programmes need to be developed which are strong both in techniques and methodology. It is also stated that different kinds of teaching aids are required such as written-workbooks, handbooks, guides and library path finders, and audio-visual (slides, tape-slides, videotapes, films, audio-tapes etc.).

183. Dougherty, Richard.M., op. cit. no. 137, p.1055

184. Krishan Kumar., op. cit., no. 180, p. 85-98

Chapter III

QUESTIONNAIRE ANALYSIS

This chapter deals with the analysis and interpretation of the data collected through questionnaire, personal interview with researchers and librarians, direct observation, discussion with experts and case studies.

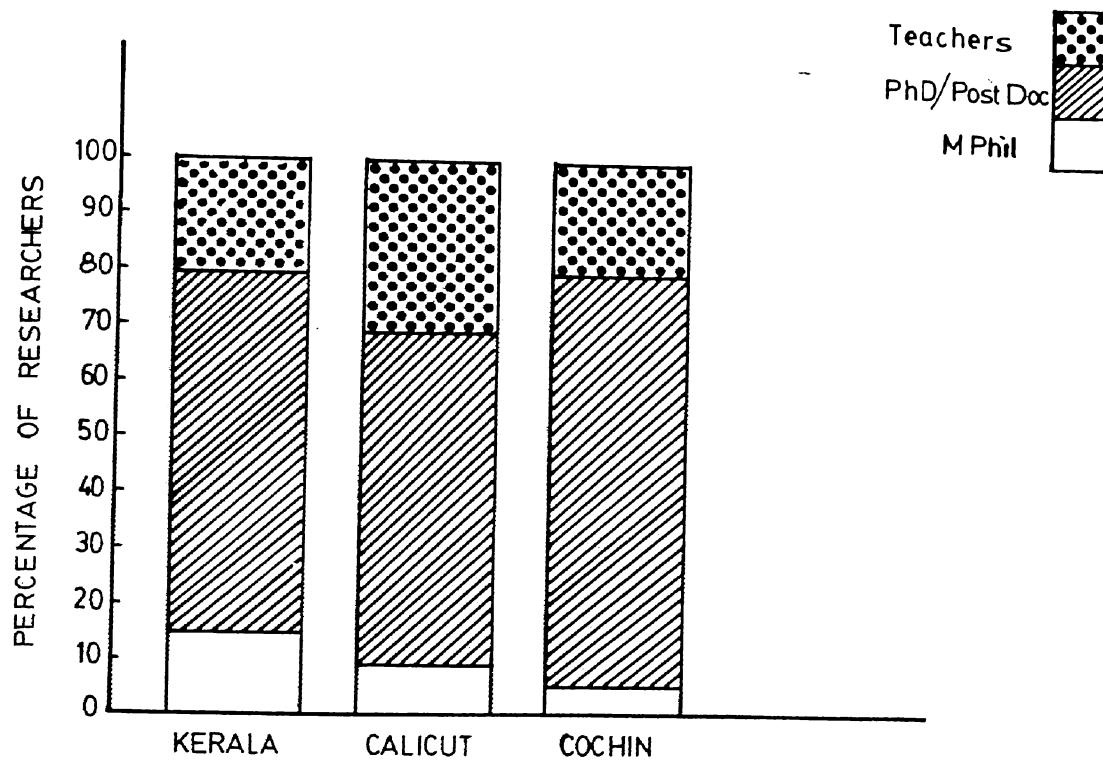
3.1 Population studied

The population studied is a heterogenous group, according to the live registers (attendance) maintained by the various departments of the concerned universities.

Objectives formulated for the study are:-

- 1) To understand the background of the researchers in the science faculties of Kerala, Calicut and Cochin universities.
- 2) To know how they search for the documents in the departmental libraries and university libraries.
- 3) To evaluate the sufficiency of collections and services in the departmental, university and other libraries.
- 4) To understand the document procurement methods at the local and national level.
- 5) To know the extent of use of translation facilities

FIGURE: 1 BREAK UP OF RESEARCHERS (IN %) BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



Biology	-	5	2	7	7.07	-	-	-	-	-	-	-	-	-	-	-	-	-	7	2.36
Bio-chemistry	1	6	3	10	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-	10	3.37
Botany	2	13	3	18	18.18	2	13	6	21	20.79	-	-	-	-	-	-	-	-	39	13.13
Chemistry	1	2	3	6	6.06	2	13	10	25	24.75	2	32	6	40	41.24	71	23.91	-	-	-
Geology	-	3	3	6	6.06	-	-	-	-	-	-	-	-	-	-	6	2.02	-	-	-
Mathematics	3	4	2	9	9.09	2	3	4	9	8.91	1	17	3	21	21.65	39	13.13	-	-	-
Physics	2	7	1	10	10.10	2	13	4	19	18.81	2	7	4	13	13.40	42	14.14	-	-	-
Statistics	2	4	1	7	7.07	-	1	1	2	1.98	-	-	-	-	-	9	3.03	-	-	-
Life Science	-	-	-	-	-	-	2	2	4	3.97	-	-	-	-	-	4	1.35	-	-	-
Zoology	3	21	2	26	26.24	1	15	5	21	20.79	-	-	-	-	-	47	15.82	-	-	-
Marine Science	-	-	-	-	-	-	-	-	-	-	-	16	7	23	23.71	23	7.74	-	-	-

Total	14	65	20	99	100	9	60	32	101	100	5	72	20	97	100	297	100
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%	14.14	65.66	20.20	100	-	8.91	59.41	31.68	100	-	5.15	74.23	20.62	100	-	-	-
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6) To find out the need for user education.

7) To get suggestions for the better organisation of the libraries.

The data gathered have been tabulated and organised in terms of the objectives of the study to facilitate analysis and interpretation.

In the analysis done of the schedule of interview of levels of researchers and librarians, the findings agreed with analysis of the questionnaire. Hence the findings of the interview are not separately included.

Table 1 shows the break-up of the responded population according to subject of research and levels of researchers.

3.2 Background information

The questionnaire was administered partly in person and partly by post to 576 users. But the completed responses collected were only 297, giving a response rate of 51.5%.

3.3 Research duration

While studying the background of the respondents, it was felt desirable to know how long each has been

DISTRIBUTION OF Ph.D/POST-DOCTORAL FELLOWS RELATING TO RESEARCH EXPERIENCE BY UNIVERSITIES

Experience in years	Kerala		Calicut		Cochin	
	Number of Persons	Percentage	Number of Persons	Percentage	Number of Persons	Percentage
0 - 1	6	9.2	8	13.3	18	25
1 - 2	11	16.9	13	21.7	11	15.3
2 - 3	18	27.7	15	25	11	15.3
3 - 4	10	15.4	16	26.7	16	22.2
4 - 5	8	12.3	3	5	8	11.1
Above 5 years	12	18.5	5	8.3	8	11.1
Total	65	100	60	100	72	100.

engaged in research activities. For this purpose the Ph.D/Post-doctoral students were asked to say the duration of their research and the teachers their total research experience. In the case of M. Phil students this was not necessary as their research duration is uniformly one academic year. In the case of the Ph.D. students, the minimum period prescribed varies according to university regulations but it is normally 2 years. Although the maximum duration is 5 years extension can be obtained as per regulations.

In the case of the Ph.D/Post-doctoral students, the data obtained through the survey reveals the following picture.

Table 2 shows that 18.5% Ph.D/ Post-doctoral fellows in Kerala university are not able to complete their research work even after 5 years. Same is the case with 8.3% Ph.D/ Post-doctoral fellows in the Calicut university and 11.1% Ph.D/ Post-doctoral fellows in the Cochin university. One obvious reason for the delay is that they are not getting the relevant documents for their work in time. In the case of 12.3% Ph.D/ Post-doctoral fellows in Kerala university, 5% in Calicut university and 11.1% in Cochin university, the research period ranges from 4 to 5 years.

Table 3

DISTRIBUTION OF TEACHERS RELATING TO RESEARCH EXPERIENCE BY UNIVERSITIES

Experience in years.	Kerala		Calicut		Cochin	
	No. of persons	%	No. of persons.	%	No. of persons	%
0 - 5	1	5	4	12.5	2	10
5 - 10	2	10	3	9.4	4	20
10 - 15	2	10	6	18.8	8	40
15 - 20	5	25	5	15.6	2	10
20 - 25	5	25	2	6.2	2	10
Above 25	5	25	4	12.5	2	10
Not available.	-	-	8	25	-	-
Total	20	100	32	100	20	100

15.4% Ph.D/ Post-doctoral fellows in Kerala university, 26.7% in Calicut university, and 22.2% in Cochin university are doing research over a period of 3 to 4 years. The duration in the case of 27.7% in Kerala university, 25% in Calicut university and 15.3% in Cochin university is from 2 to 3 years. For 16.9% Ph.D/ Post-doctoral fellows in Kerala university, 21.7% in Calicut university and 15.3% in Cochin university, their research is 1 to 2 years old. 9.2% in Kerala university, 13.3% in Calicut university and 25% in Cochin university are in the first year of their research. It is observed that the duration of Ph.D research varies from 1 to 5 years or more. Those who have taken more than 5 years are seen more in the Kerala university.

3.4 Research experience

University teachers are expected to be engaged in research activities side by side with their teaching works. They may be either engaged with some approved research projects or pursuing own research problems for purpose of publication or otherwise. Therefore their period of teaching experience is generally counted as the period of their research experience.

Data shown in Table 3 reveals as follows:-

Twenty five per cent teachers from the Kerala university, 12.5% from Calicut university and 10% from the Cochin university are having research experience of above 25 years. 25% teachers from Kerala university, 6.3% from Calicut university, and 10% from Cochin university have 20 to 25 years research experience. 25% teachers from Kerala university, 15.6% from Calicut university and 10% teachers from Cochin university have research experience ranging from 15 to 20 years. 10% teachers from Kerala university, 18.8% from Calicut university, and 40% teachers from Cochin university have put in 10 to 15 years , research experience. 10% from Kerala university, 9.4% from Calicut university and 20% teachers from Cochin university have research experience ranging from 5 to 10 years, 5% from Kerala university, 12.5% from Calicut university and 10% from Cochin university have research experience below 5 years.

The data reveals that 85% teachers in Kerala university, 53.2% teachers in Calicut university and 70% teachers in Cochin university have more than 10 years, experience in research field.

In order to find out informations on how the researchers search for documents, two types of questions were included in the questionnaire like search for macro-documents and

search for micro-documents in the departmental libraries. Sub-questions were included to elicit information on the method of collecting information, difficulties faced by them and any suggestions they have to improve the situation.

3.5 Search for macro-documents.

The questionnaire contains 10 questions aimed at eliciting information on how the respondents search for macro-documents like books mainly in their departmental libraries. Questions were asked about the use of subject lists of books/ bibliographies and the library catalogues, usefulness of classification, the assistance received from staff in locating books, etc.

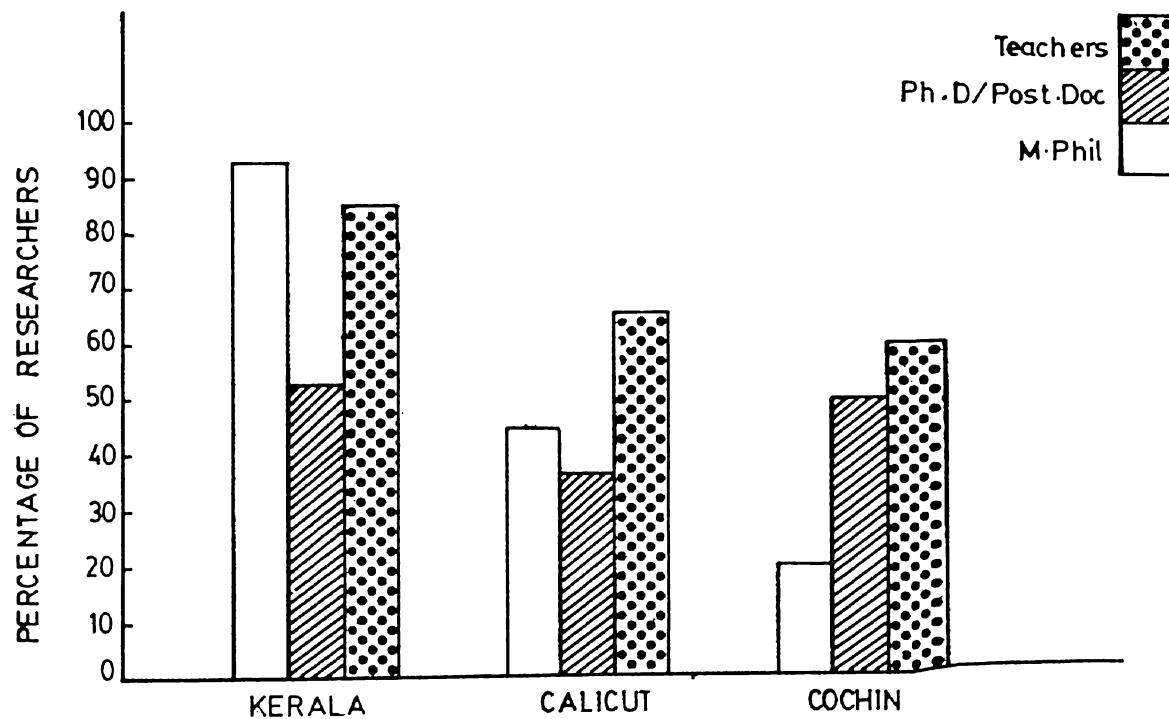
3.5.1 Consultation of bibliographies

Bibliographies are generally used to identify or obtain details of a particular piece of literature and to search out materials in a given subject area.

Bibliographies can be general bibliographies, subject bibliographies and bibliographies of special materials.

The subject bibliographies save the time of the user by providing a ready made literature search or survey of the subject. A bibliography further helps in going from secondary literature to the primary literature in an unfamiliar field.

FIGURE: 2 PERCENTAGE OF RESEARCHERS CONSULTING BIBLIOGRAPHY BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



Name of University	Type of Researchers.	Kerala		Calicut		Cochin		Sub-total		ALL	
		No.	%	No.	%	No.	%	No.	%	No.	%
Kerala	M. Phil.	13	92.9	1	7.1	-	-	-	-	14	100
	Ph.D/Post-doc	33	50.8	29	44.6	3	4.6	3	4.6	65	100
	Teachers.	17	85	3	15	-	-	-	-	20	100
Sub-total.		63	63.6	33	33.3	3	3.1	3	3.1	99	100
Calicut	M. Phil.	4	44.4	4	44.4	1	11.2	1	11.2	9	100
	Ph.D/Post-doc	22	36.7	26	43.3	12	20	12	20	60	100
	Teachers.	21	65.6	9	28.1	2	6.3	2	6.3	32	100
Sub-total		47	46.5	39	38.6	15	14.9	15	14.9	101	100
Cochin	M. Phil	1	20	4	80	-	-	-	-	5	100
	Ph.D/Post-doc.	36	50	36	50	-	-	-	-	72	100
	Teachers.	12	60	6	30	2	10	2	10	20	100
Sub-total.		49	50.5	46	47.4	2	2.1	2	2.1	97	100
ALL		159	53.5	118	39.7	20	6.8	20	6.8	297	100

The analysis of the response to the question No. 5.1 gives this information for Kerala university: 92.9% M. Phil students, 50.8% Ph.D/ Post-doctoral students, and 85% teachers are consulting bibliographies for their research work.

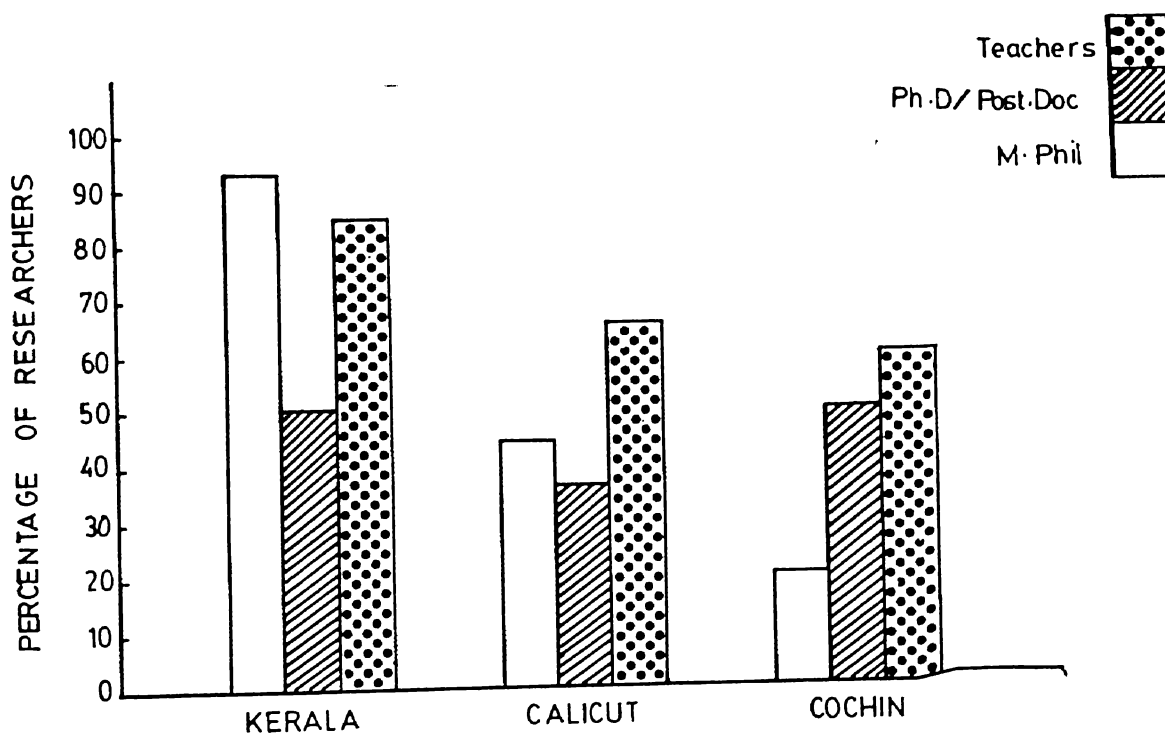
It also reveals that in the Calicut university, 44.4% M. Phil students, 36.7% Ph.D/ Post-doctoral students and 65.6% teachers in Calicut university are consulting bibliographies.

Data also shows that 20% M. Phil students, 50% Ph.D/ Post-doctoral students and 60% teachers are consulting bibliographies for their research activities in Cochin university.

3.5.2 Listing of bibliographies used

Further by question number 5.2 the respondents were asked to list the bibliographies available in their libraries. But only 106 out of 297 (35.69%) were able to list some title or the other. Even in the case of those who have listed, the bibliographies are not significant ones. Most of the departmental libraries are reported to have useful subject bibliographies concerned with their subjects. This shows that the vast majority of the researchers did not have adequate exposure to the bibliographical sources in their areas of work.

FIGURE: 3 PERCENTAGE OF RESEARCHERS USING LIBRARY CATALOGUE BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



DISTRIBUTION OF RESEARCHERS ACCORDING TO USE OF LIBRARY CATALOGUE BY UNIVERSITY AND TYPE

OF RESEARCHERS

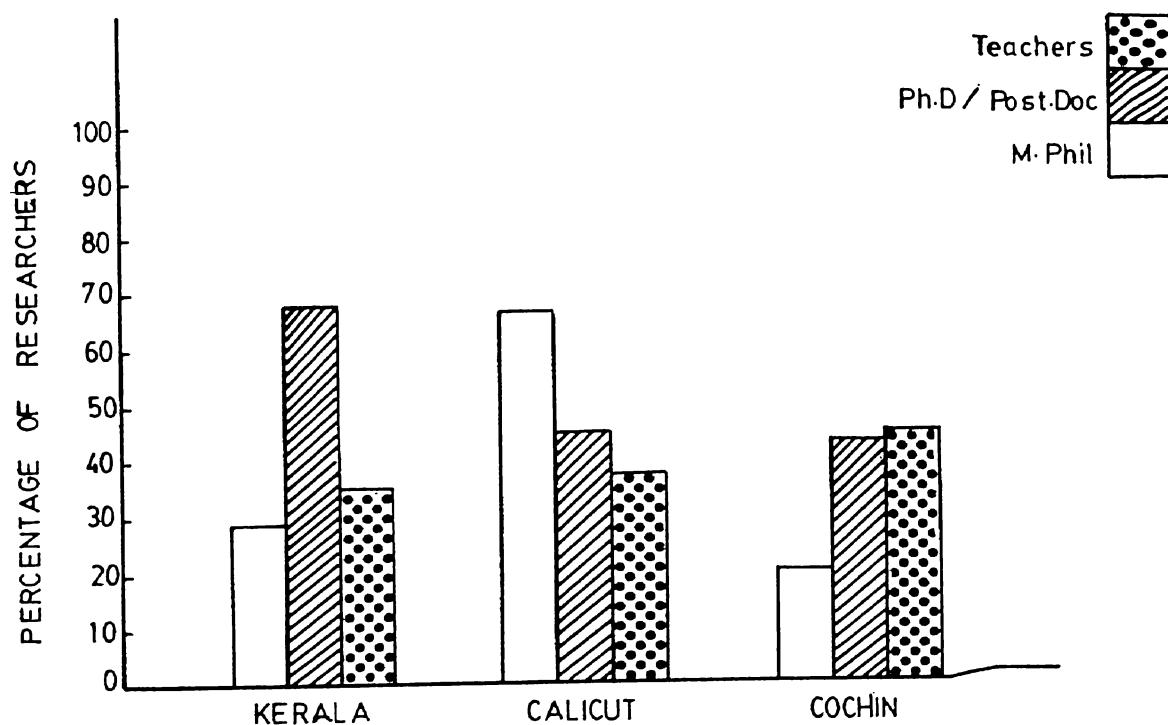
Name of University	Type of researchers	Consulting		Not consulting		Not available		Total	
		No.	%	No.	%	No.	%	No.	%
Kerala	M. Phil	13	92.9	1	7.1			14	100
	Ph.D/Post Doc.	33	50.8	44	66.4	3	4.6	80	100
	Teachers	17	85	4	19			20	100
	Sub-total	63	63.6	49	49.3	3	3.1	115	100
Calicut	M. Phil	4	44.4	4	44.4	1	11.1	9	100
	Ph.D/Post Doc.	22	36.7	43	71.3	12	20	80	100
	Teachers	21	65.7	20	61.9	2	6.1	43	100
	Sub-total	47	46.5	67	66.6	15	14.9	129	100
Cochin	M. Phil	1	20	0				1	100
	Ph.D/Post Doc.	36	50	0				36	100
	Teachers	12	60	0		2	10	20	100
	Sub-total	49	50.5	0		2	2.1	51	100
ALL		159	53.5	51	16.7	20	6.7	230	100

3.5.3 Consultation of library catalogue

Since the library catalogue gives a complete list of books held in the stock of the library, it has a primary place in literature search. By-passing the catalogue may lead to missing information on several relevant items as the open shelves in the library will not be able to exhibit all of them, many important books being in constant circulation.

The general picture that emerges from analysis of the answers to the question on catalogue use by various groups of researchers is that only 53.5% of the researchers are consulting library catalogue. One noticeable information is that 92.9% of the M. Phil students in the Kerala university are making use of the catalogue. But in the case of M.Phil students in Calicut and Cochin universities, the catalogue use is only 44.4% and 20% respectively. In the case of the Ph.D/ Post-doctoral students, the catalogue use is 50.8% in Kerala, 50% in Cochin and 36.7% in Calicut. As regards, teachers, the catalogue use is much higher, 85% in Kerala, 65.7% in Calicut and 60% in Cochin. When the catalogue use in the three universities is separately considered, it is found to be the least in Calicut university. There

FIGURE: 4 PERCENTAGE OF RESEARCHERS EXPERIENCING DIFFICULTY IN GETTING THE REQUIRED INFORMATION FROM THE LIBRARY CATALOGUE BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



FROM THE LIBRARY CATALOGUE BY UNIVERSITY AND
TYPE OF RESEARCHERS

Name of University	Type of Researchers	Difficulty No.	Difficulty %	No difficulty No.	Not available No.	Difficulty %	Total No.	Total %
Kerala	M. Phil	4	28.6	10	-	71.4	14	100
	Ph.D/Post Doc.	44	67.7	18	3	27.7	65	100
	Teachers	7	35	11	2	55	20	100
	Sub-total	55	55.5	39	5	39.4	99	100
Calicut	M. Phil	6	66.7	3	-	33.3	9	100
	Ph.D/Post Doc.	27	45	25	8	41.7	60	100
	Teachers	12	37.5	18	2	56.3	32	100
	Sub-total	45	44.6	46	10	45.5	101	100
Cochin	M.Phil	1	20	4	-	80	5	100
	Ph.D/Post Doc.	31	43.1	41	-	56.9	72	100
	Teachers	9	45	10	1	50	20	100
	Sub-total	41	42.2	55	1	56.7	97	100
ALL		141	47.5	140	16	47.1	297	100

is a clear indication that there is something lacking, probably a lack of awareness about the use of the catalogue.

3.5.4 Approach to library catalogue

In questions No. 5.4 and 5.5, the researchers are asked to say for what specific approach they were using the library catalogue. Analysing the answers it was found that 43 out of 72 (59.72%) teachers, 120 out of 197 (60.91%) Ph.D/Post-doctoral fellows and 19 out of 28 (67.86%) M. Phil students were using the catalogue to obtain information on books on a specific subject of their interest. This is an indication that they were using the library catalogue for literature search in their subjects.

3.5.5 Difficulty in catalogue consultation

Question No. 5.6, is to find out whether the researchers had experienced any difficulty in getting the required information from the catalogue.

Their responses are tabulated and presented in Table 6.

In Kerala university 71.40% M. Phil students said that they are not facing any difficulty in getting the needed information from the library catalogue. In Calicut univer-

FIGURE. 5 PERCENTAGE OF RESEARCHERS GETTING ASSISTANCE FROM LIBRARY STAFF BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, COCHIN AND CALICUT.

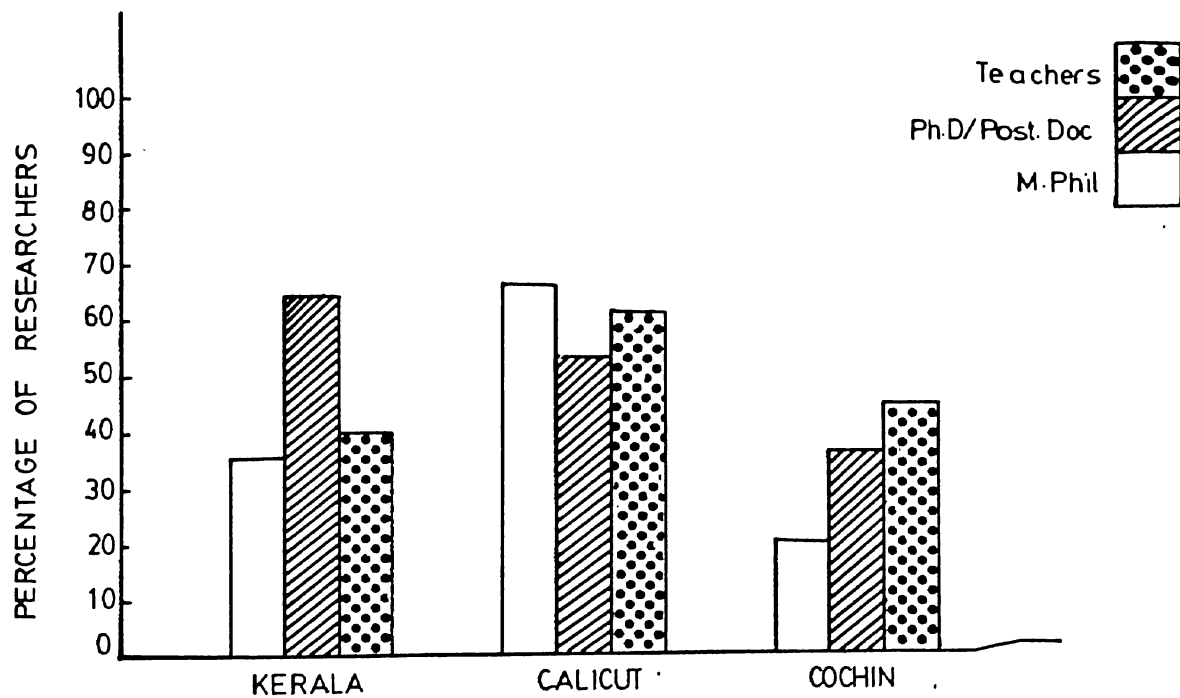


Table 7

DISTRIBUTION OF RESEARCHERS GETTING ASSISTANCE FROM LIBRARY STAFF BY
UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	No.	%	Getting assistance No.	Not Getting assistance No.	%	Not available	Total
Kerala	M.Phil	5	35.7	2	14.3	7	50	14
	Ph.D/Post doc.	42	64.6	22	33.8	1	1.5	65
	Teachers	8	40	1	5	11	55	20
	Sub-total.	55	55.6	25	25.3	19	19.1	99
Calicut	M.Phil	6	66.7	1	11.1	2	22.2	9
	Ph.D/Post-doc.	32	53.3	4	6.7	24	40.	60
	Teachers	18	56.3	14	43.8	-	-	32
	sub-total	56	55.4	19	18.8	26	25.8	101
Cochin	M.Phil	1	20	4	80	-	-	5
	Ph.D/Post doc.	26	36.1	5	6.9	41	56.9	72
	Teachers	9	45	5	25	6	30	20
	Sub-total							100

sity, 33.3% M. Phil students and in Cochin university 80% M. Phil students are also not facing any difficulty. As regards the Ph.D/ Post-doctoral students, 67.7% in Kerala, 45% in Calicut and 43.1% in Cochin are facing difficulty for required information from the library catalogue. Among teachers, 35% in Kerala, 37.5% in Calicut and 45% in Cochin are facing difficulty in collecting information from the library catalogue. The problem can be solved only by offering library orientation programme.

3.5.6 Assistance from library staff

Question No. 5.7 is aimed at knowing about help from the library staff.

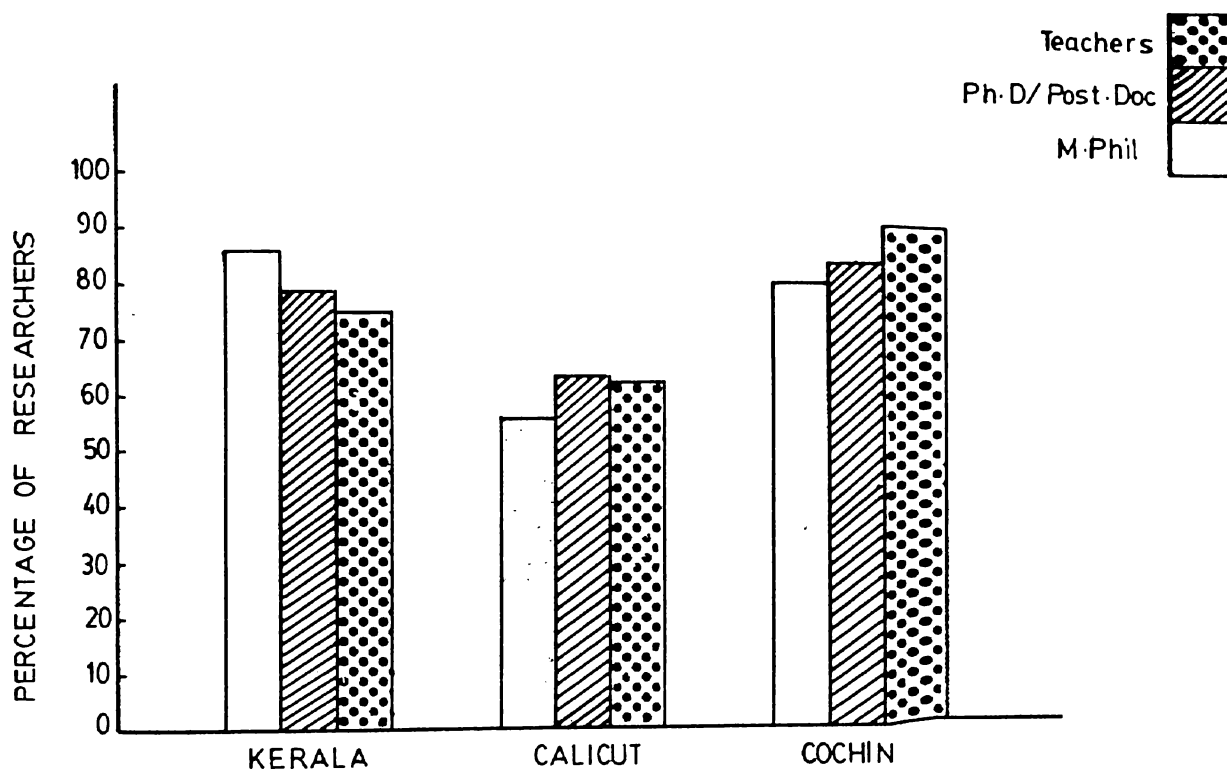
Table 7 shows that 35.7% M. Phil students in Kerala, 66.7% in Calicut and 20% in Cochin are getting assistance from the library staff. As regards Ph.D/ Post-doctoral students, 64.6% in Kerala, 53.3% in Calicut and 36.1% in Cochin are getting help from the library staff. Among teachers, 40% in Kerala, 56.3% in Calicut and 45% in Cochin are getting assistance from the library staff in their search for information.

3.5.7 Awareness about classification

Question Nos. 5.8 and 5.9 are about classification.

Researchers were asked to state whether they are able to follow the classification and if not whether they are

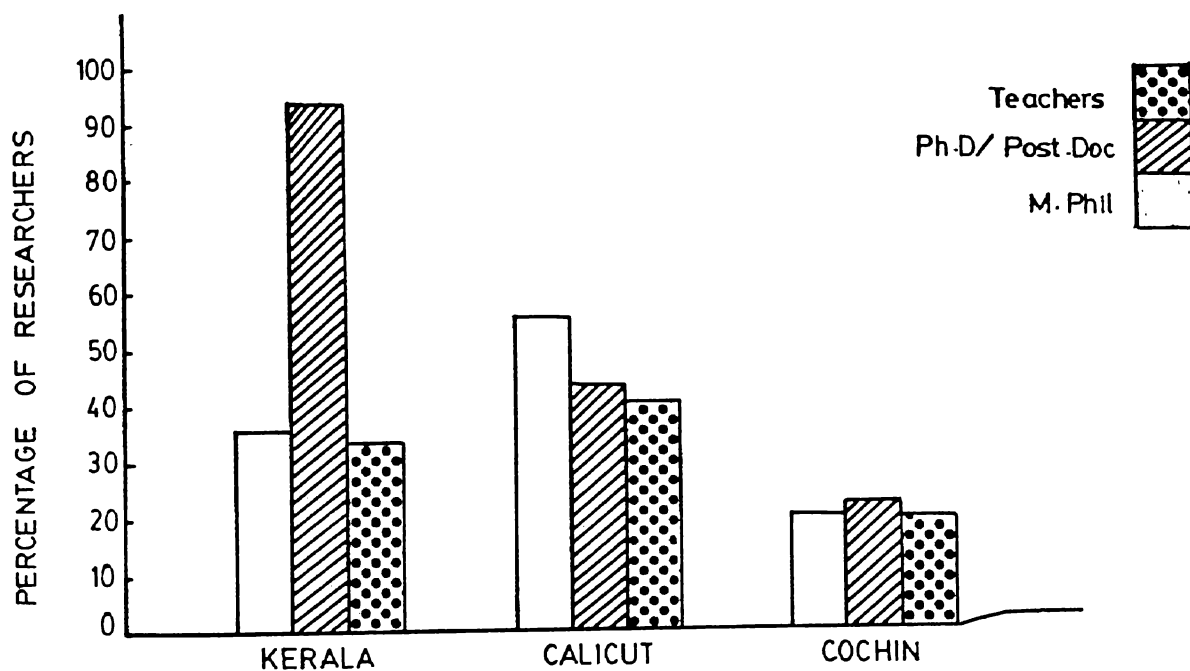
FIGURE: 6 PERCENTAGE OF RESEARCHERS ACCORDING TO THEIR AWARENESS OF CLASSIFICATION BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



DISTRIBUTION OF RESEARCHERS ACCORDING TO THEIR AWARENESS OF CLASSIFICATION BY
UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	Aware		Not Aware		Not available		Total	
		No.	%	No.	%	No.	%	No.	%
Kerala	M.Phil	12	85.7	2	14.3	-	-	14	100
	Ph.D/Post-doc.	51	78.5	13	20	1	1.6	65	100
	Teachers	15	75	4	20	1	5	20	100
	Sub-Total	78	78.8	19	19.2	2	2	99	100
Calicut	M.Phil	5	55.6	4	44.4	-	-	9	100
	Ph.D./Post-doc.	38	63.3	18	30	4	6.7	60	100
	Teachers	20	62.5	9	28.1	3	9.4	32	100
	Sub-Total	63	62.4	31	30.7	7	6.9	101	100
Cochin	M.Phil	4	80	1	20	-	-	5	100
	Ph.D/Post-doc.	60	83.3	12	16.7	-	-	72	100
	Teachers	18	90	2	10	-	-	20	100
	Sub-Total	82	84.5	15	15.5	-	-	97	100

FIGURE: 7 PERCENTAGE OF RESEARCHERS GETTING HELP FROM THE LIBRARY STAFF TO LOCATE DOCUMENTS BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



Name of University	Type of Researchers	Assistance		No Assistance		Not available		Total	
		No.	%	No.	%	No.	%	No.	%
Kerala	M.Phil	5	35.7	2	14.3	7	50	14	100
	Ph.D/Post-doc.	60	93.8	3	4.7	1	1.6	64	100
	Teachers	7	33.3	1	4.8	13	61.9	21	100
Sub-Total		72	72.7	6	6.1	21	21.2	99	100
Calicut	M.Phil	5	55.6	1	11.1	3	33.3	9	100
	Ph.D/Post-doc.	26	43.3	2	3.3	32	53.4	60	100
	Teachers	13	40.6	2	6.3	17	53.1	32	100
Sub-Total		44	43.6	5	5	52	51.4	101	100
Cochin	M.Phil	1	20	4	80	-	-	5	100
	Ph.D./Post-doc.	16	22.2	2	2.8	54	75	72	100
	Teachers	4	20	1	5	15	75	20	100
Sub-Total		21	21.6	7	7.2	69	71.2	97	100
ALL		137	46.1	18	6.1	142	47.8	297	100

getting any assistance from the library staff in locating the books.

Table 8 shows awareness of classification by different categories of researchers in the three universities. While a large majority of the researchers in the Kerala and Cochin universities mentioned that they were able to follow the classification system, the response from the Calicut university was much less. It shows that the library users in Calicut were not given adequate initiation to classification.

Table 9 shows the extent of help in locating books received by the researchers of all three universities together. It can be found that 11 out of 28 (39.29%) M. Phil students, 102 out of 197 (51.78%) Ph.D/ Post-doctoral students, and 24 out of 72 (33.33%) teachers received assistance from the library staff. While the rate of assistance from staff is the highest in Kerala (72.7%), the lowest is in Cochin. (21.6%).

35.8 Suggestions for technical organisation

Question No. 5.10 is to elicit suggestions, if any, for improving the technical organisation of the library.

Kerala university

Twenty three per cent of the teachers of Kerala university have made the following suggestions:-

1) Books, journals etc. which are acquired by the Departmental libraries are not classified and catalogued immediately. These books are to be processed and sent for issue as early as possible.

2) Ph.D/ Post-doctoral students of Kerala university (24.6%) have made the following suggestions:-

a) They prefer uniform classification and cataloguing system in the departmental libraries and university library.

b) Title index card is to be prepared for each book

c) Some prefer application of computer in technical processing in library.

d) A display board is to be made in the departmental libraries indicating catalogue number, subject, shelf number and so on.

e) It is better to have a qualified staff at the catalogue cabinet section to help and guide the users in the university libraries.

Calicut university

3) M. Phil students (28.6%) have stated that librarians in the departmental libraries should have subject background.

4) Teachers of Calicut university (15.6%) have stressed

Kerala university

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d) A display board is to be made in the departmental libraries indicating catalogue number, subject, shelf number and so on.

e) It is better to have a qualified staff at the catalogue cabinet section to help and guide the users in the university libraries.

Calicut university

3) M. Phil students (28.6%) have stated that librarians in the departmental libraries should have subject background.

4) Teachers of Calicut university(15.6%) have stressed the need for systematic shelf rectification and frequent

dusting of shelves.

Cochin University

5) Teachers of Cochin university (34.7%) have made the following suggestions:-

- a) There should be systematic rectification of shelves.
- b) duplicate copies of same volumes should be clearly mentioned in the catalogue.
- c) list of additions should be distributed in the departmental / university libraries for proper directions.,
- d) distribute booklet to follow classification and to locate various subjects easily.,
- e) classification system should accomodate the very nascent subjects also.,
- f) title index and subject index should be separately prepared.

The difficulties experienced by the researchers are real. They point to the imperative need for improving the technical services in libraries.

3.6. Search for Micro-documents.

The question no. 6 of the questionnaire (13 questions) is aimed at showing information on how the

respondents search for micro-documents like articles in periodicals, research theses, standards, patents etc. in their departmental libraries. Questions were asked about the reading habit of journals on regular basis, compilation of relevant bibliography, sources which helped in the preparation of bibliography, consultation of indexing/ abstracting journals, consultation of index to journals, cumulative index to journals, Reviews such as Progress in, Advances in series, consultation of bibliographies relevant to their subject, sufficiency of departmental library etc.

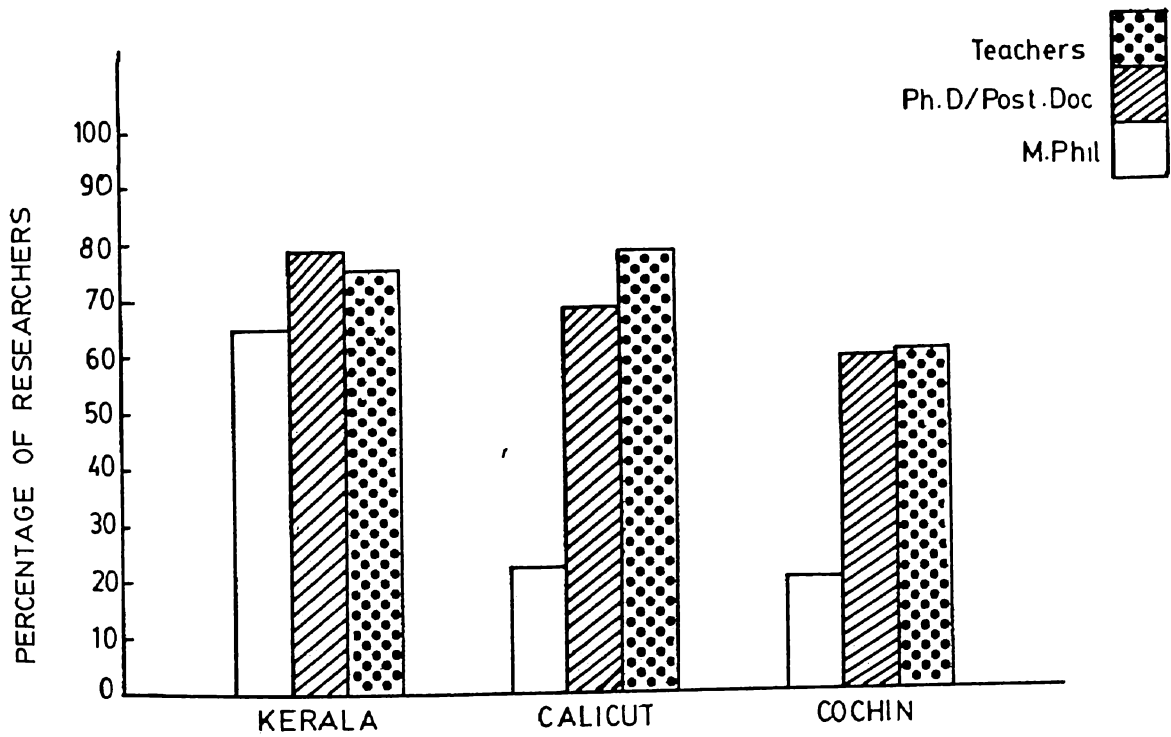
3.6.1 Consultation of relevant journals

Periodicals are the carriers of latest information in science and technology and their role in research needs no overemphasis.

Question no. 6.1 is asked to list the number of journals they use to understand the use of journals on a regular basis for literature search.

According to the level of researchers, who responded, 67 out of 72 teachers (93.05%), 169 out of 172 Ph.D/ Post-doctoral students, (85.78%), 20 out of 28 M. Phil students (71.42%) are making use of journals on periodical basis

FIGURE: 8 PERCENTAGE OF RESEARCHERS COMPILING BIBLIOGRAPHY FOR RESEARCH BY
LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND
COCHIN.



Name of University	Type of Researchers	Compiling		Not compiling		Not available		Total	
		No.	%	No.	%	No.	%	No.	%
Kerala	M.Phil	9	64.3	4	28.6	1	7.1	14	100
	Ph.D/Post-doc	51	78.5	12	18.5	2	3.1	65	100
	Teachers	15	75	5	25	-	-	20	100
	Sub-Total	75	75.8	21	21.2	3	3	99	100
Calicut	M.Phil	2	22.2	5	55.6	2	22.2	9	100
	Ph.D/Post-Doc.	41	68.3	16	26.7	3	5	60	100
	Teachers	25	78.1	4	12.5	3	9.4	32	100
	Sub-Total	68	67.3	25	24.8	8	7.9	101	100
Cochin	M.Phil	1	20	4	80	-	-	5	100
	Ph.D/Post-doc.	48	59.8	19	26.4	10	13.8	72	100
	Teachers	12	60	7	35	1	5	20	100
	Sub-Total	61	60	30	35	11	5	102	100

for literature search.

Most of the departmental librarians are reported to have useful periodicals concerned with their subjects depending on the library budgets.

3.6.2 Compilation of bibliography

Question No. 6.2 is to elicit the use of bibliography relevant to research topic at the beginning of research.

In the case of micro-documents, a researcher should prepare a list of periodical publications relevant to one's topic. Once decided to include a document, an entry according to bibliographic references has to be prepared. For ready reference or consultation, these entries have to be arranged in a proper order. Compilation of bibliography requires a systematic approach and knowledge of techniques and a perspective of the subject.

Table 10 shows that 64.3% M. Phil students of the Kerala university are compiling bibliography for research purpose whereas it is only 20% in Cochin university.

Among the Ph.D/ Post-doctoral students, those in the Kerala university 78.5% are compiling bibliography for

their research work, while in Cochin university it is only 59.8%.

Teachers of Calicut university 78.1% are compiling bibliography in their research work. But in Cochin university, it is only 60%.

The study shows the low awareness of the M. Phil students of Calicut and Cochin university about the use of bibliography in literature search. This should be included in search methodology course in these universities.

3.6.3 Sources used in bibliography

Further by Question numbered 6.3 , Respondents are asked to list the sources available in the libraries that helped them in the preparation of bibliography. Only 146 out of 297 (49.16%) were able to list any bibliography. Most of the departmental libraries have useful sources relevant to their subjects. This clearly shows that a majority of the researchers did not have much exposure to the relevant bibliographical sources.

3.6.4 Use of Indexing and Abstracting journals

There is a steady increase in the output of periodical literature. This necessitated more problems in bibliographic control. Indexing and Abstracting journals owe their origin to this need. Indexing journal is an index to the



FIGURE: 9 PERCENTAGE OF RESEARCHERS ACCORDING TO THEIR USE OF INDEXING AND ABSTRACTING JOURNALS BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.

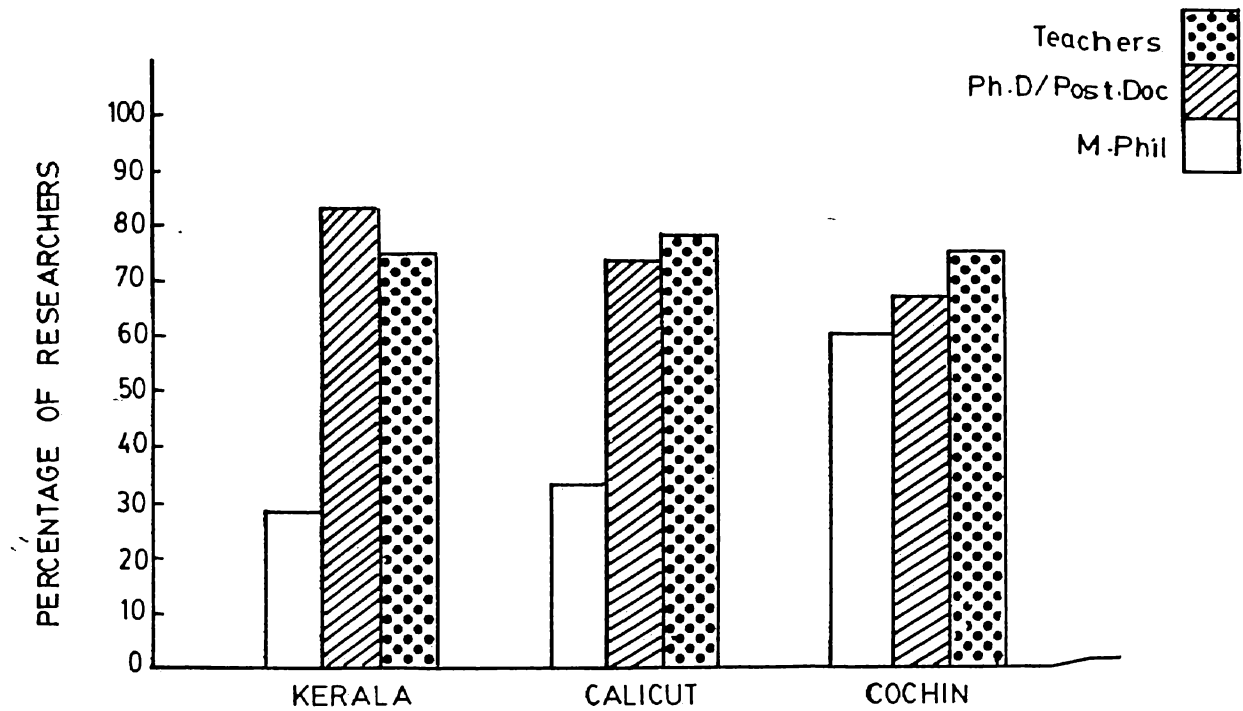


Table 11

DISTRIBUTION OF RESEARCHERS ACCORDING TO THEIR USE OF INDEXING AND ABSTRACTING
JOURNALS BY UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	No.	%	No.	%	No.	%	No.	%	Total
Kerala	M.Phil	4	28.6	10	71.4	-	-	14	-	100
	Ph.D/Post-doc.	54	83.1	10	15.4	1	1.5	65	-	100
	Teachers	15	75	4	20	1	5	20	-	100
	Sub-Total	73	73.7	24	24.3	2	2	99	-	100
Calicut	M.Phil	3	33.3	6	66.7	-	-	9	-	100
	Ph.D/Post Doc.	44	73.3	12	20	4	6.7	60	-	100
	Teachers	25	78	2	6.3	5	15.7	32	-	100
	Sub-Total	72	71.3	20	19.8	9	8.9	101	-	100
Cochin	M.Phil	3	60	2	40	-	-	5	-	100
	Ph.D/post Doc.	48	66.7	14	19.4	10	13.9	72	-	100
	Teachers	15	75	3	15	2	10	20	-	100
	Sub-Total	66	68	19	19.6	12	12.4	97	-	100
ALL		211	71	63	21.2	23	7.8	297	-	100

contents of several journals and other publications within a subject field. Abstracting journal is also an indexing journal but in addition it gives a brief abstract of each article.

Question Number 6.4 is used to elicit the rate of use of indexing and abstracting journals.

Table 11 shows that among the Ph.D/ Post-doctoral students, those in the Kerala university 83.1% are the largest users of indexing and abstracting journals and those in Cochin university make the least use 66.7%.

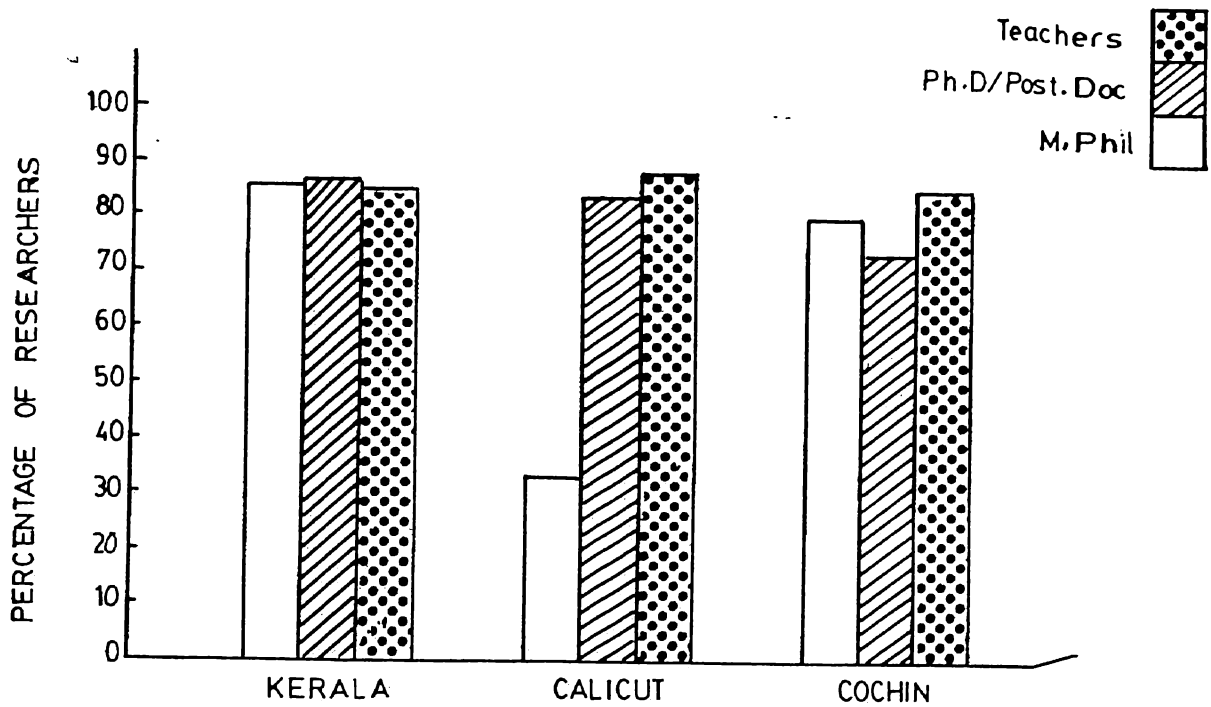
Among teachers those in the Calicut university 78% make the largest use of indexing and abstracting journals.

The awareness of indexing and abstracting journals is not high among the M. Phil students in all the three universities. The highest, in Cochin university is only 60%. This point is to be considered in user education activities.

3.6.5 Listing Indexing and Abstracting journals used Regularly

Question numbered 6.5 is to list the indexing and

FIGURE: 10 PERCENTAGE OF RESEARCHERS ACCORDING TO THEIR USE OF INDEXES OF JOURNALS BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



DISTRIBUTION OF RESEARCHERS ACCORDING TO THEIR USE OF INDEXES OF JOURNALS

BY UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	Consulting No.	Consulting %	Not consulting No.	Not consulting %	Not available No.	Total %
Kerala	M.Phil	12	85.8	1	7.1	14	100
	Ph.D/post doc.	56	86.2	7	10.8	65	100
	Teachers	17	85	3	15	20	100
	Sub-total	85	85.9	11	11.1	99	100
Calicut	M.Phil	3	33.3	6	66.7	9	100
	Ph.D/Post doc.	50	83.3	7	11.7	60	100
	Teachers	28	87.6	3	9.4	32	100
	Sub-total	81	80.2	16	15.8	101	100
Cochin	M.Phil	4	80	1	20	5	100
	Ph.D/post doc.	53	73.6	10	13.9	72	100
	Teachers	17	85	3	15	20	100
	Sub-total	74	76.3	14	14.4	97	100
ALL		240	80.8	41	13.8	297	100

abstracting journals in regular use in the departmental libraries. 192 out of 297 (64.65%) were able to list some journals. Most of the departmental libraries have useful indexing and abstracting journals concerned with their subjects. The responses show that 35.35% researchers did not have adequate exposure to the indexing and abstracting journals in their areas of work.

3.6.6 Use of Index of periodicals

Index is a key to the contents of the different issues of a volume of a journal. It provides a systematic sustained subject analysis of the contents of such materials arranged alphabetically, chronologically, numerically or in any other chosen order.

Question No. 6.6 is aimed at knowing the use of indexes of volumes of journals to locate the required articles.

It can be seen from Table 12, that among the M. Phil students those in the Kerala university 85.8% make the largest use of index of journals. Those of Calicut university make the least use 33.3%. With regard to Ph.D/ Post-doctoral students, those in the Kerala university 86.2% make the largest use of index of journals. and those in Cochin university make the least use 73.6%.

FIGURE: 11 PERCENTAGE OF RESEARCHERS ACCORDING TO USE OF CUMULATIVE INDICES OF JOURNALS BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.

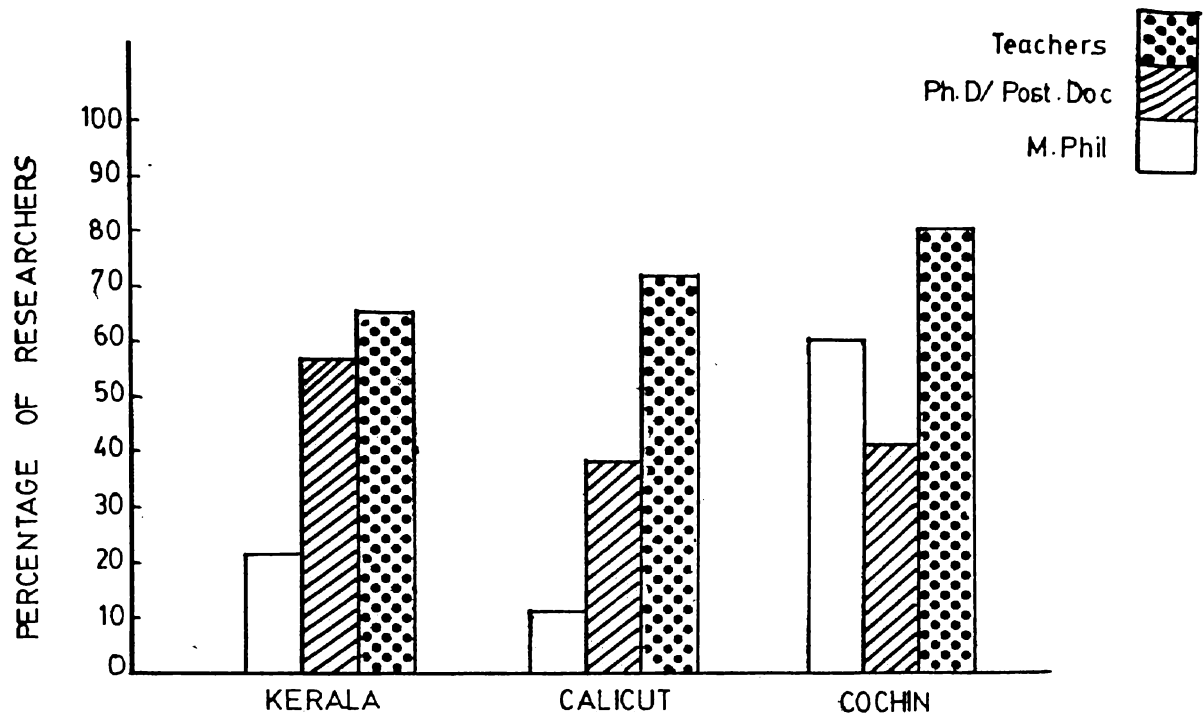


Table 13

DISTRIBUTION OF RESEARCHERS ACCORDING TO USE OF CUMULATIVE INDICES OF JOURNALS

BY UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	No.	%	Consulting	No.	%	Not Consulting	No.	%	Not available	No.	%	Total
Kerala	M.Phil	3	21.4	10	71.4	1	7.2	14	100				
	Ph.D./Post-doc.	37	56.9	27	41.5	1	1.6	65	100				
	Teachers	13	65	6	30	1	5	20	100				
Sub-Total		53	53.5	43	43.4	3	3.1	99	100				
Calicut	M.Phil	1	11.1	6	66.7	2	22.2	9	100				
	Ph.D./Post-doc.	23	38.3	29	4.3	8	13.4	60	100				
	Teachers	23	71.8	6	18.8	3	9.4	32	100				
Sub-Total		47	46.5	41	40.6	13	12.9	101	100				
Cochin	M.Phil	3	60	2	40	-	-	5	100				
	Ph.D./Post-doc.	30	41.7	28	38.9	14	19.4	72	100				
	Teachers	16	80	4	20	-	-	20	100				
Sub-Total		49	50.5	34	35.1	14	14.4	97	100				
ALL		149	50.2	118	39.7	30	10.1	297	100				

Teachers in Calicut university (87.6%) are the largest users of index of journals.

3.6.7 Use of cumulative indices of journals

Cumulative index is one which is built from time to time by combining separately published indexes into one sequence. A cumulative index of 10 volumes will be a consolidation of the 10 volumes. So the literature search by using cumulative indices will be easier and less time consuming.

Question No. 6.7 is put to collect the use of cumulative index of journals in literature search. The analysis of question No. 6.7 showed that 21.4% M. Phil students in the Kerala university have consulted cumulative indices of journals, but only 11.1% in Calicut and 60% in Cochin. Only 56.9% Ph.D/ Post-doctoral students are making use of cumulative indices of journals in Kerala university, 38.3% in Calicut university and only 41.7% in Cochin university. Teachers in Cochin university 80% make the largest use of cumulative indices and 65% in Kerala make the lowest use.

M. Phil students on the whole, 7 out of 28 (25%) make very little consultation of cumulative indices of

journals. Ph.D/ Post-doctoral students are also not making adequate use. (For example only 38.3% in Calicut). A glaring need for user education in this area is indicated.

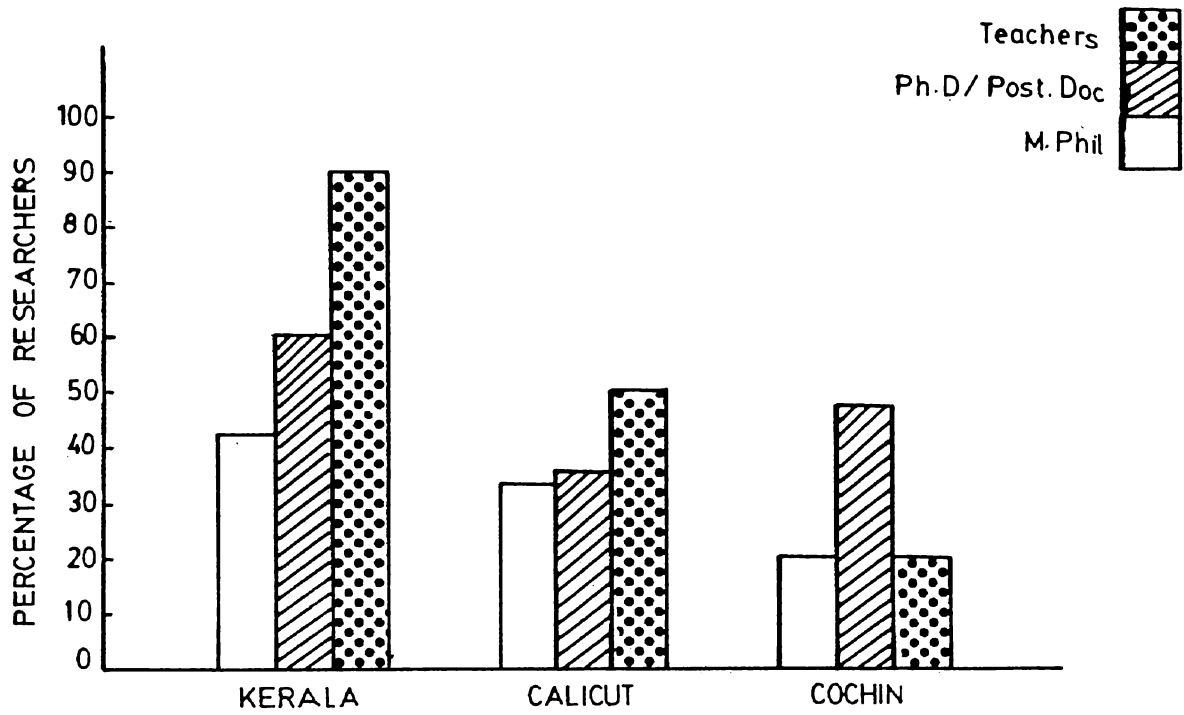
3.6.8 Listing of cumulative indices of journals

Question No. 6.8 aim at listing the cumulative indices of journals used. Only 82 out of 297 (27.61%) were able to list any title. Even in the list prepared, some are found to be insignificant ones, though most departmental libraries are reported to have useful cumulative indexes. This clearly brings out that the majority of the researchers do not have adequate exposure to the cumulative indexes of journals.

3.6.9 Consultation of Review serials

Reviews or review serials critically summarise the progress made over a certain time in a given subject field. Reviews include (1) Reviews which survey their topic at an advanced level for the benefit of specialists backing up abstracting or indexing journal coverage of the literature and (2) those written for the more general reader. This type of review enable the specialist to be aware of the developments in fields related to but outside his

FIGURE: 12 PERCENTAGE OF RESEARCHERS ACCORDING TO USE OF REVIEWS BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



own speciality.

Review articles appear in primary journals, conference proceedings, books and review serials. Review periodicals are devoted to the publication of reviews. The title may begin with 'Advances in.....' or 'Progress in '.

Question No. 6.9 is to elicit the use of reviews in literature search.

Table 14 shows that among the M. Phil students, Kerala university with 42.9% make the highest use and Cochin university the least use 20%. Among Ph.D/ Post-doctoral students, 60% of Kerala make the largest use and Cochin the least use 47.2%. Maximum use by teachers in Kerala is 90% and Cochin university makes the least use 20%.

The library users are to be given adequate initiation in the use of reviews.

3.6.10 Listing of reviews

Question Number 6.10 aims to collect the list of reviews available in the libraries, used by the respondents. Only 125 out of 297 (42.09%) were able to list any review. Even in the case of those who have listed, the titles are

FIGURE: 13 PERCENTAGE OF RESEARCHERS ACCORDING TO USE OF OTHER BIBLIOGRAPHIES FOR RESEARCH BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.

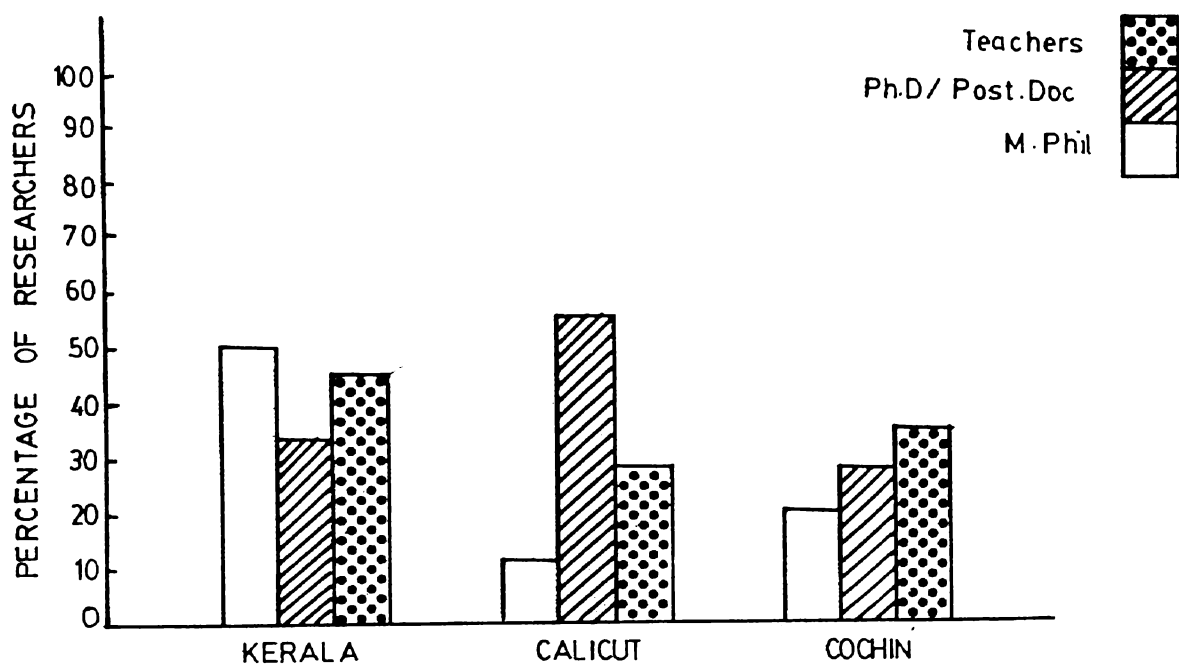


Table 15

DISTRIBUTION OF RESEARCHERS ACCORDING TO USE OF OTHER BIBLIOGRAPHIES FOR
RESEARCH WORK BY UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	No.	%	No.	%	Consulting Not available	No.	%	Total
Kerala	M.Phil	7	50	6	42.9	1	7.1	14	100
	Ph.D./Post Doc.	22	33.8	43	66.2	-	-	65	100
	Teachers	9	45	9	45	2	10	20	100
Sub-Total		38	38.3	58	58.6	2	2.02	99	100
Calicut	M.Phil	1	11.1	6	66.7	2	22.2	9	100
	Ph.D./Post.Doc.	33	55	12	20	15	25	60	100
	Teachers	9	28.13	16	50	7	21.9	32	100
Sub-Total		43	42.6	34	33.7	24	23.8	101	100
Cochin	M.Phil	1	20	4	80	-	-	5	100
	Ph.D./Post Doc.	20	27.8	34	47.2	18	25	72	100
	Teachers	7	35	9	45	4	20	20	100
Sub-Total		28	28.9	47	48.5	23	23.7	97	100
ALL		109	36.7	139	46.8	49	16.5	297	100

not significant ones. Most of the departmental libraries have useful reviews. This clearly shows that a majority of the researchers do not have exposure to the review sources in their research area.

3.6.11 Use of other relevant bibliographies

Question No. 6.11 is put to elicit the use of bibliographies having a relevance on the topic of research.

Table 15, shows that among the M. Phil students those of the Kerala university 50% make the largest use of other bibliographies and those of Calicut university the least use 11.1%. Among the Ph.D/ Post-doctoral students, Calicut university 55% make the largest use and Cochin university make the least use 27.8%. Among teachers, only 45% of Kerala university, 28.13% of Calicut university and 35% of Cochin university are consulting other bibliographies.

Table 15, shows the strong need for initiation in use of other relevant bibliographies at all levels and in all the three universities.

3.6.12 Listing of other relevant bibliographies

Question No. 6.12 was put to collect a list of other bibliographies having relevance to the topic of research of the respondents in their libraries. Only 42 out of 297 (14.4%) were able to list any item. Even

DISTRIBUTION OF RESEARCHERS REGARDING SUFFICIENCY OF DEPARTMENTAL LIBRARY BY
UNIVERSITY AND TYPE OF RESEARCHER

Name of University	Type of Researchers	Less than 25%		25-50%		50-75%		Above 75%		Not available		Total
		No.	%	No.	%	No.	%	No.	%	No.	%	
Kerala	M.Phil	5	35.7	2	14.3	3	21.4	3	21.4	1	7.1	14
	Ph.D./Post Doc.	20	30.8	22	33.8	14	21.5	4	6.2	5	7.7	65
	Teachers	6	30	10	50	3	15	1	5	-	-	20
	Sub-Total	31	31.3	34	34.3	20	20.2	8	8.1	6	6.1	99
Calicut	M.Phil	-	-	2	22.2	4	44.4	3	33.3	-	-	9
	Ph.D./Post Doc.	8	13.3	27	45	18	30	6	10	1	1.7	60
	Teachers	6	18.8	16	50	9	28.1	1	3.1	-	-	32
	Sub-Total	14	13.9	45	44.6	31	30.7	10	9.9	1	1	101
Cochin	M.Phil	-	-	-	-	-	-	5	100	-	-	5
	Ph.D./Post Doc.	14	19.4	26	36.1	17	23.6	5	6.9	10	13.9	72
	Teachers	9	45	5	25	2	10	3	15	1	5	20
	Sub Total	23	23.7	31	32	19	19.6	13	13.4	11	11.3	97
ALL		68	22.9	110	37	70	23.6	31	10.4	18	6.1	297

when they listed many insignificant titles were included. This again shows the lack of exposure to the bibliographical sources having relevance to their research area.

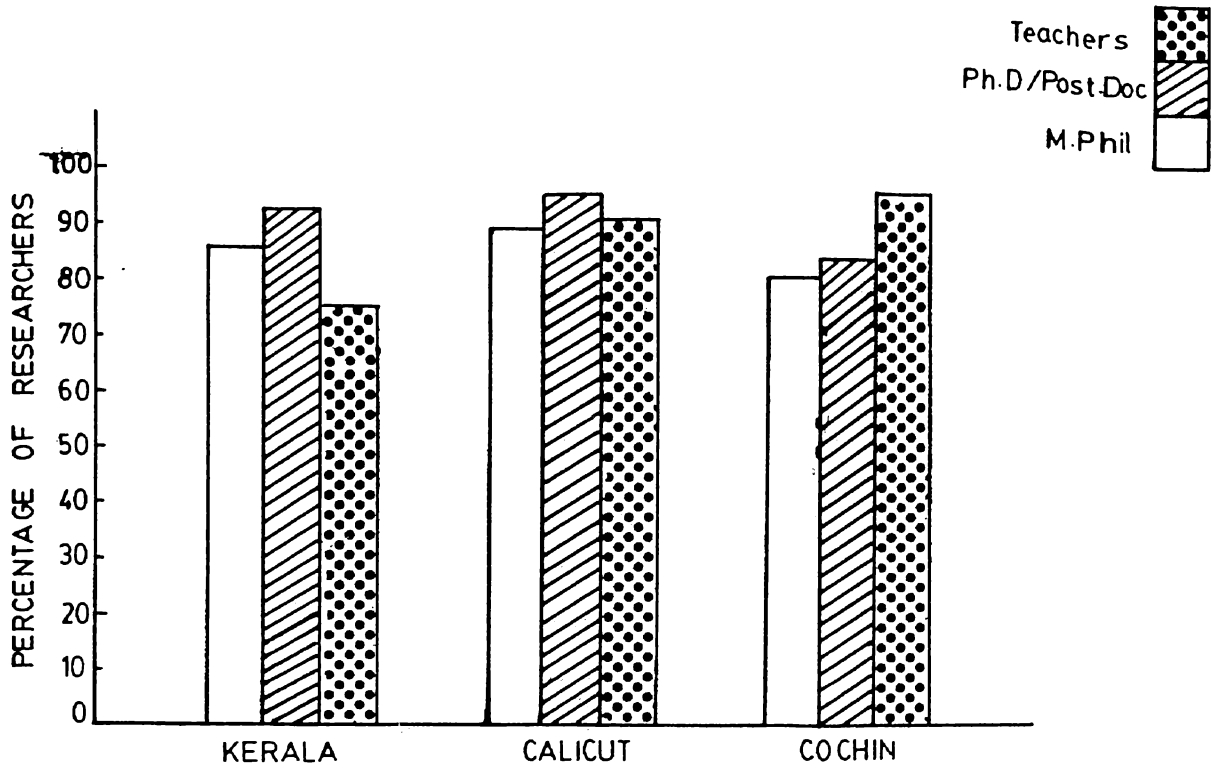
3.6.13 Sufficiency of Departmental library

The object of question no. 6.13 is to evaluate the adequacy of departmental libraries for research work.

Table 16 shows that 35.7% M. Phil students of Kerala university are meeting only less than 25% of their research requirements by the departmental library. Among Ph.D/ Post-doctoral students, 30.8% in Kerala university, 13.3% in Calicut university and 19.4% in Cochin university are meeting less than 25% of their research requirements. Among teachers, 30% in Kerala university are finding the departmental library useful at the rate of less than 25% of their research requirements. It is 18.8% in Calicut and 45% in Cochin university.

M. Phil students of Cochin university (100%) find the sufficiency of department library above 75%. 6.2% Ph.D/ Post-doctoral students of Kerala university, 10% of Calicut university and 6.9% of Cochin university meet above 75% of their research requirements.

FIGURE: 14 PERCENTAGE OF RESEARCHERS ACCORDING TO USE OF UNIVERSITY LIBRARY FOR RESEARCH WORK BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



DISTRIBUTION OF RESEARCHERS ACCORDING TO USE OF UNIVERSITY LIBRARY FOR RESEARCH PURPOSE

BY UNIVERSITY AND TYPE OF RESEARCHERS

University	Type of researchers	Using		Not using		Not available		Total	
		No.	%	No.	%	No.	%	No.	%
M. Phil	M. Phil	12	85.7	2	14.3	-	-	14	100
	Ph.D/Post-doc	60	92.3	2	3.1	3	4.6	65	100
	Teachers	15	75	3	15	2	10	20	100
	Sub-total	87	87.9	7	7.1	5	5.1	99	100
M. Phil	M. Phil	8	88.9	1	11.1	-	-	9	100
	Ph.D/Post-doc	57	95	1	1.7	2	3.3	60	100
	Teachers	29	90.6	3	9.4	-	-	32	100
	Sub-total	84	93.1	5	5	2	1.9	101	100
M. Phil	M. Phil	4	80	1	20	-	-	5	100
	Ph.D/Post-doc	60	83.4	6	8.3	6	8.3	72	100
	Teachers	19	95	1	5	-	-	20	100
	Sub-total	60	61.9	30	31	7	7.1	97	100
ALL		203	68.4	81	27.3	13	4.4	297	100

Among the research scholars, 44.6% of the Calicut university are meeting 25-50% of their research needs with the help of departmental library and 30.7% are meeting 50-75% of their research needs.

3.7 Use of University library

The question No. 7 contains 2 questions showing information on the use of the university library and the extent of using it.

Question No. 7.1 is put to study the extent of use of University library.

Table 17 shows that by levels of researchers, the M. Phil students of Calicut university make the largest use (88.9%) , use in Kerala university is 85.7% and that in Cochin is 80%. But for Ph.D/ Post-doctoral students, the use of University library is Calicut 95%, Kerala 92.3% and Cochin 83.4%. The per centage for teachers are Cochin 95%, Calicut 90.6% and Kerala 75%.

3.7.1 Extent of use of University library

Question No. 7.2 shows the extent of use of university library by the researchers. Out of 28 M. Phil students of all the three universities, 5 (17.86%), 5(17.86%),

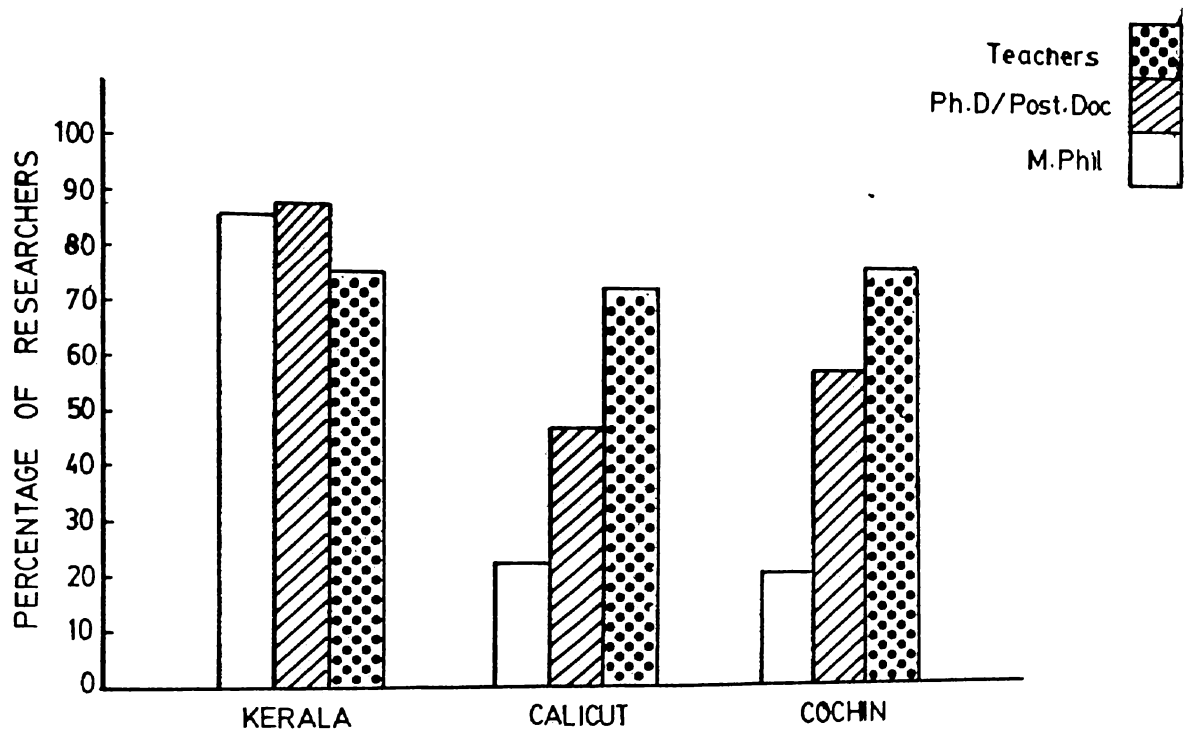
3 (28.57%), and 10 (35.71%) are making use of university library daily, twice a week, once a week and occasionally respectively. Out of the 197 Ph.D/ Post-doctoral researchers, 28 (14.21%), 44 (22.34%), 40 (20.30%), and 85 (43.15%) are using the library daily, twice a week, once a week and occasionally respectively. 7 (9.72%), 13 (18.1%), 11 (15.28%), and 41 (56.94%) out of 72 teachers are using the University library daily, twice a week, once a week and occasionally for literature search.

3.8 Use of other libraries

No library however big can be self sufficient for the needs of a researcher. So researcher will have to consult other libraries in the course of his research. The survey indicates that the researchers are willing to travel and to take the trouble of going to libraries at distance including University libraries and special libraries to gather material.

Question No. 8 contains two sub-questions. 8.1 which shows how the respondents use libraries other than departmental and University library to meet their information requirements and 8.2 lists other libraries used for literature search.

FIGURE: 15 PERCENTAGE OF RESEARCHERS ACCORDING TO USE OF LIBRARIES OTHER THAN DEPARTMENT/UNIVERSITY LIBRARY BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



DISTRIBUTION OF RESEARCHERS ACCORDING TO THE USE OF LIBRARIES OTHER THAN

DEPARTMENT/UNIVERSITY LIBRARY BY UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	Using No.	Using %	Not using No.	Not using %	Not available No.	Total %
Kerala	M.Phil	12	85.7	2	14.3	-	14 100
	Ph.D/Post doc.	57	87.7	8	12.3	-	65 100
	Teachers	15	75.0	5	25.0	-	20 100
	Sub-total	84	84.8	15	15.2	-	99 100
Calicut	M.Phil	2	22.2	7	77.8	-	9 100
	Ph.D/Post doc.	28	46.7	26	43.3	6	60 100
	Teachers	23	71.9	9	28.1	-	32 100
	Sub-total	53	52.5	42	41.6	6	101 100
Cochin	M.Phil	1	20	4	80.0	-	5 100
	Ph.D/Post doc.	41	56.9	24	33.3	7	72 100
	Teachers	15	75	5	25	-	20 100
	Sub-total	57	58.8	33	34	7	97 100
ALL		194	65.3	90	30.3	13	297 100

Table 18 shows that 85.7% of the M. Phil students of Kerala university are making highest use of libraries other than departmental and university library. M. Phil students of Cochin university are making least use of other libraries 20%. Among Ph.D/ Post-doctoral students, 87.7% in Kerala university make largest use of other libraries for literature search. 46.7% Ph.D/Post-doctoral students in Calicut university are making least use of other libraries for research work. Among Teachers, 75% of Kerala and Cochin universities are making highest use of other libraries for research work.

Taking into consideration all levels of researchers, researchers of Kerala university are making better use of other libraries for literature search. This may be due to the access of better libraries in the Trivandrum city.

3.6.2 Question No. 8.2 aims to list the libraries other than university and departmental library used for literature search. Taking the level of research, 13 out of 28 (46.43%), 106 (53.8%) out of 197 and 53 (73.61%) out of 72 M. Phil, Ph.D/ Post-doctoral students and Teachers of various universities are making use of libraries other

than university and departmental libraries for literature search.

List of other libraries used by researchers in Kerala

- 1) Kerala Agricultural University Library, Trichur
- 2) C.P.C.R.I. Library, Kasaragod
- 3) Kerala Forest Research Institute, Peechi
- 4) C.W.R.D.M., Calicut
- 5) Medical College Library, Calicut
- 6) Tropical Botanical Garden and Research Institute, Trivandrum
- 7) V.S.S.C. Library, Trivandrum
- 8) British Council Library, Trivandrum
- 9) Medical College Library, Trivandrum
- 10) State Central Library, Trivandrum
- 11) Centre for Development Studies, Ulloor
- 12) CESS, Trivandrum
- 13) Sree Chithratirunal Medical Centre, Trivandrum
- 14) CTCRI, Trivandrum
- 15) Mar Ivanios College Library, Trivandrum
- 16) N.P.O.L., Cochin
- 17) National Institute of Oceanography Regional Centre, Cochin
- 18) C.M.F.R.I., Cochin
- 19) Union Christian College, Alwaye
- 20) CIFT, Cochin

The following are the list of libraries outside Kerala used for literature search.

- 1) I.I.T., Madras
- 2) I.I.T., Kanpur
3. Ramanujan Institute, Madras
- 4) I.I.Sc., Bangalore
- 5) Indian Institute of Astrophysics, Bangalore
- 6) T.N.A.U., Coimbatore
- 7) I.I.T., Delhi
- 8) Department of Mathematics, Madurai Kamaraj University
- 9) Mathscience, Madras
- 10) I.S.I., Calcutta
- 11) Zoology department, Aligarh Muslim University
- 12) INSDOC, Delhi
- 13) BARC, Bombay
- 14) TIFR, Bombay
- 15) Institute of Entomology, Madras
- 16) ICAR, New Delhi
- 17) Radcliffe Science Library, Oxford
- 18) Osmania University Library, Hyderabad
- 19) N.I.O., Library, Goa
- 20) Botanical Library, Maltair University
- 21) National Botanical Research Institute, Lucknow
- 22) CCERCI, Karaikudi

23) Mangalore University Library

24) College of Fisheries, Mangalore

3.9 Document procurement

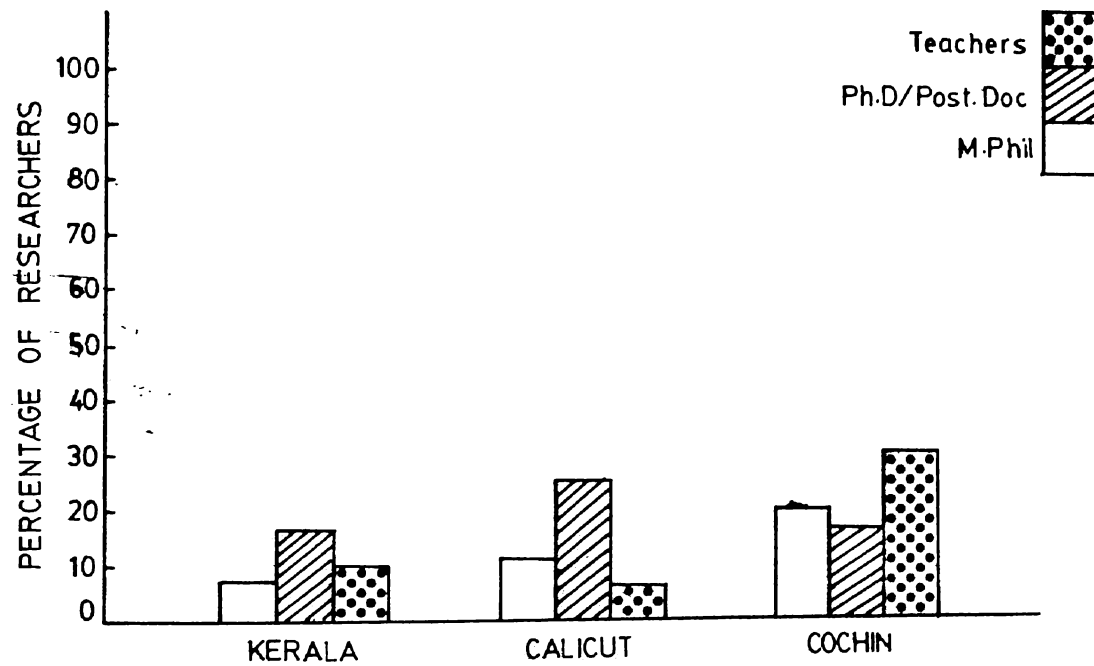
Question No. 9 deals with the procurement of documents not available in the parent library and consists of (9.1) regarding use of union catalogue, (9.2) steps to access documents not available in the library and (9.3) getting any help from department or university library to access documents.

3.9.1 Use of Union catalogue

A union catalogue is a finding list or catalogue of the holdings of several libraries within a region or country. It also indicates the location of every copy of the documents held by those libraries. They are arranged alphabetically by authors or title in a single sequence. In an institutional set up where there are departmental and central libraries, a Union catalogue of the entire holdings will be very useful.

Union catalogue is essentially a location tool to locate the availability of the required type of material. It helps the researchers and the libraries to obtain on loan the required document or the reader is directed

FIGURE: 16 PERCENTAGE OF RESEARCHERS USING UNION CATALOGUE BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.



DISTRIBUTION OF RESEARCHERS USING UNION CATALOGUE BY UNIVERSITY AND

TYPE OF RESEARCHERS

Name of University	Type of Researchers	Consulting No.	Consulting %	Not consulting No.	Not consulting %	Not available No.	Total %
Kerala	M.Phil	1	7.1	13	92.9	-	14 100
	Ph.D/Post doc.	11	16.9	54	83.1	-	65 100
	Teachers	2	10	15	75	2	10 20 100
		14	14.1	82	82.9	3	3.1 99 100
	Sub-total						
Calicut	M.Phil	1	11.1	8	88.9	-	9 100
	Ph.D/Post doc.	15	25	45	75	-	60 100
	Teachers	2	6.25	8	25	22	68.8 32 100
		18	17.9	61	60.4	22	21.8 101 100
	Sub-total						
Gopalin	M.Phil	1	20	4	80	-	5 100
	Ph.D/Post doc.	12	16.7	60	83.3	-	72 100
	Teachers	6	30	8	40	6	30 20 100
		19	19.6	72	74.2	6	6.2 97 100
	Sub-total						
ALL		51	17.2	215	72.4	31	10.4 297 100

to visit that library to consult it. Union catalogue also helps for a cooperative effort to reduce the unnecessary duplication and to ensure the availability of a big collection around.

Table 19 shows the extent of use of union catalogue by the researchers. Among the M. Phil students, only one respondent is using union catalogue. Among Ph.D/ Post-doctoral students, those in the Calicut university make the highest use of union catalogue 25% and those of Calicut university make the least use 16.7%. Among teachers, Cochin university with 30% make the highest use and Calicut university 6.25% make the least use.

Generally the researchers are less aware of the use of Union catalogue in literature search. Hence the need of initiation on Union catalogue.

3.9.2 Access to required documents not available in libraries visited

Question No. 9.2 , aims at knowing the access to the documents not available in libraries.

Before a topic is chosen, the researcher has to consult as many bibliographical sources as possible on his subject. A bibliography or reading list is to be prepared to avoid duplication of work in the choice of the topic. After preparing the list, the researcher has to gain access to

the sources containing the references. Some sources may be available in his own library which can be located with the help of library catalogue. For items not available in his library, a Union catalogue could help him to indicate where such documents are available. He can go to the concerned libraries and read there or he can get the volumes on inter-library loan. If it is an article, the researcher can request for reprints directly to the authors or to the libraries for copies. For papers in unknown languages, the researcher can ask for translation. Microfilm/microfiches of the required documents could also be sought.

3.9.2.1 Inter-library loan

Inter-library loan is one of the earliest co-operative activities of the library. It helps to procure the documents not in the library but available in other libraries, on loan for a specific period. This system will help the library to save a lot of money and space. Most of the libraries in India have accepted Inter-library loan as one of these services.

3.9.2.2 Reprints

Represent extra copies of an article published in a journal. These may be circulated among interested colleagues to keep them informed of current work.

Table 20

DISTRIBUTION OF RESEARCHERS CONCERNING ACCESS TO UNAVAILABLE DOCUMENTS IN THE VISITED
LIBRARIES BY UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	Inter lib- rary loan.			Reprl- nts			Photo- copy.			Micro- film			Micro- fiche			Not ava- ilable.			Total
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
Kerala	M.Phil	3	21.4	5	35.7	9	64.3	3	21.4	3	21.4	3	21.4	-	-	14	-	-	-	14
	Ph.D/Post-doc.	9	13.8	26	40	50	77	43	66.1	42	64.6	42	64.6	-	-	65	-	-	-	65
	Teachers	9	45	14	70	16	80	13	65	13	65	13	65	1	5	20	1	5	5	20
	Sub Total	21	21.2	45	45.5	75	75.8	59	59.6	58	58.6	58	58.6	1	1.01	99	1	1.01	1.01	99
Calicut	M.Phil	-	-	4	44.4	3	33.3	-	-	-	-	-	-	2	22.2	9	2	22.2	2	9
	Ph.D/Post.doc.	11	18.3	23	38.3	37	61.7	25	41.7	26	43.3	26	43.3	1	1.7	60	1	1.7	1.7	60
	Teachers	6	18.8	22	68.8	23	71.9	10	31.2	6	18.8	6	18.8	-	-	32	-	-	-	32
	Sub Total	17	16.8	49	48.5	63	62.4	35	34.7	32	31.7	32	31.7	3	3	101	3	3	3	101
Cochin	M.Phil	1	20	3	60	1	20	-	-	-	-	-	-	-	-	5	-	-	-	5
	Ph.D/Post.doc.	16	22.2	28	38.9	41	56.9	11	15.3	11	15.3	11	15.3	-	-	72	-	-	-	72
	Teachers	2	10	9	45	6	30	1	5	1	5	1	5	1	5	20	1	5	5	20
	Sub Total	19	19.6	40	41.2	48	49.5	12	12.4	12	12.4	12	12.4	1	1.03	97	1	1.03	1.03	97
ALL	Sub Total	57	19.2	134	45.1	186	62.6	106	35.7	102	34.3	102	34.3	5	1.7	297	5	1.7	1.7	297

3.9.2.3 Photocopy

The provision of photocopy is very easy by the modern developments in reprographic technique. This system is very instant and will deliver material in the original form. A nominal charge is levied for this service. This service can be given to researchers on inter-library basis also through his own library.

3.9.2.4 Microfilm/ Microfiche

Microfilms are roll film either negative or positive of 35mm or 16mm in width. These are used for reproduction of newspapers, journals, theses and so on.

Microfiche are sheet film either negative or positive with the size of a post card with frames representing pages of original document. Microfiches are produced by (1) Committee on Scientific and Technical Information (COSATI) about 4x6 inches size and carry upto 72 frames arranged in 6 rows. (2) National Microfilm Association (N.M.A) about 4x6 inches size carrying 98 frames in 7 rows of 14 each.

3.9.2.5 Inter-library loan

Table 20 shows that 21.4% M. Phil students of Kerala university are only making use of inter-library loan facility whereas M. Phil students of Calicut university

are not using this facility. Among the Ph.D/ Post-doctoral students, Cochin university make the highest use 22.2% and the least use 13.8% by the Kerala university. Kerala university teachers make the highest use 45% and Cochin university only 10%. The need for initiation on inter-library loan in all universities is very evident.

3.9.2.6 Reprint-service

60% M. Phil students of Cochin university are making highest use of reprint service while Kerala university uses 35.7%. For Ph.D/ Post-doctoral students Kerala university uses 40% and the Calicut 38.3%. Among teachers, the Kerala university make the highest use 70% and for Cochin it is 45%. The inadequacy of proper initiation is evident here also.

3.9.2.7 Phytocopying service

Among M. Phil students, Kerala university with 64.3% make the largest use and Cochin university with 20% are the least users. For Ph.D/ Post-doctoral students, Kerala university make the highest use 77% and Cochin make 56.9% use. Kerala university teachers use is 80% and use of Cochin is only 30%. The lack of initiation about photocopying service among teachers of Cochin university is evident.

FIGURE: 17 PERCENTAGE OF RESEARCHERS GETTING HELP FROM DEPARTMENTAL/
UNIVERSITY LIBRARIES VISITED TO PROCURE DOCUMENTS BY LEVEL OF
RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.

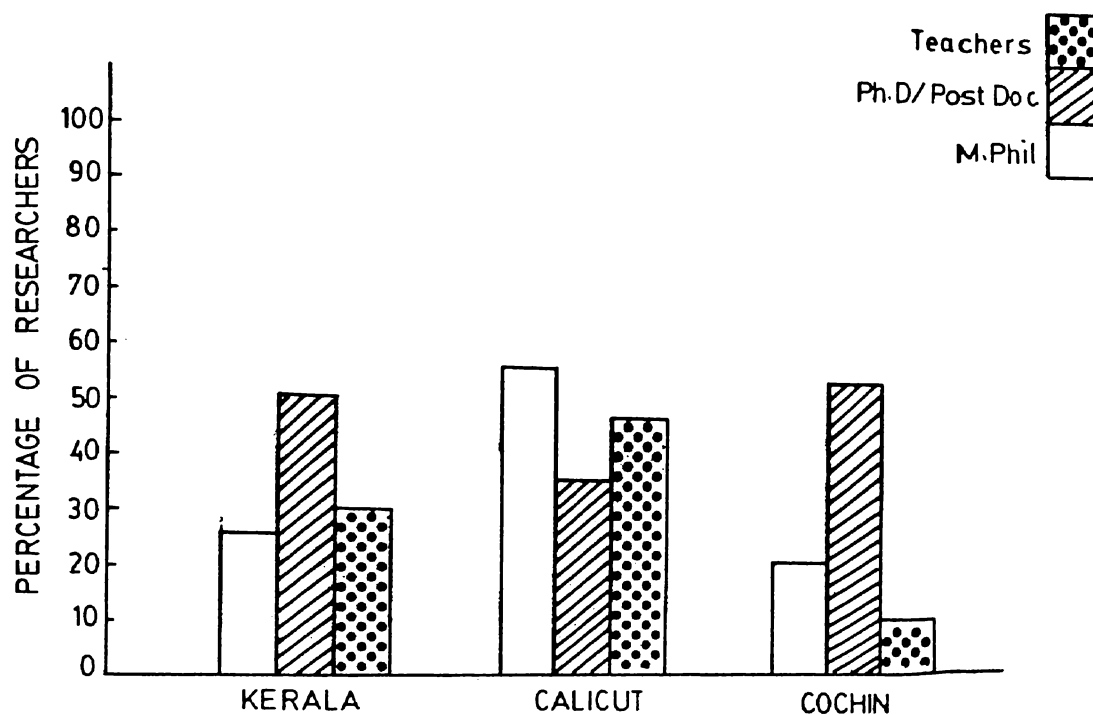


Table 21

DISTRIBUTION OF RESEARCHERS GETTING HELP FROM DEPARTMENTAL/UNIVERSITY LIBRARIES.
VISITED TO PROCURE DOCUMENTS BY UNIVERSITY AND TYPE
OF RESEARCHERS.

Name of University	Type of Researchers	No.	%	Getting	%	Not getting	%	Not available	No.	%	Total
Kerala	M.Phil.	5	35.7	6	42.9	3	21.4	14			100
	Ph.D/Post-doc.	33	50.8	31	47.7	1	1.5	65			100
	Teachers	6	30	11	55	3	15	20			100
	Sub-Total	44	44.4	48	48.5	7	7.1	99			100
Calicut	M.Phil	5	55.6	2	22.2	2	22.2	9			100
	Ph.D./Post-doc.	21	35	33	55	6	10	60			100
	Teachers	15	46.9	15	46.9	2	6.2	32			100
	Sub-Total	41	40.6	50	49.5	10	9.9	101			100
Cochin	M.Phil	1	20	4	80	-	-	5			100
	Ph.D/Post-doc.	38	52.8	19	26.4	15	20.8	72			100
	Teachers	2	10	16	80	2	10	20			100
	Sub-Total	41	42.3	39	40.2	17	17.5	97			100
ALL		126	42.4	137	46.1	34	11.5	297			100

3.9.2.8 Microfilm-service

Among M. Phil students those of Kerala university use microfilm- facility 21.4%. In Calicut and Cochin, no M. Phil student is using this facility at all. Among Ph.D/ Post-doctoral students Kerala university has 66.1% and Cochin university only 15.3%. Kerala university teachers ie. 65% make the highest use but the Cochin university use is only 5%. This service requires wide publicity among researchers of various universities under study.

3.9.2.9 Microfiche-services

Among M. Phil students, those of Kerala university use microfiche service 21.4%. In Calicut and Cochin university no M. Phil students is using this facility at all. Among Ph.D/Post-doctoral students, Kerala university has 64.6% and Cochin university has only 5%. Kerala university teachers with 65% make the highest use but Cochin university use is only 5%.

3.9.3 Help by University or Departmental library in document procurement.

Question in response to no. 9.3 whether researchers get any help from departmental library or university library to procure documents not available in the institutional library. Table 21 shows that among the M. Phil students, Calicut university 55.6% get the

AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	University Library No.	Departmental Library No.	Other libraries No.	Not available No.	Total
		No.	%	No.	%	No.
					%	
Kerala	M.Phil	2	14.3	5	35.7	7
						14
						50
						100
Kerala	Ph.D/Post doc	18	27.7	11	16.9	2
						3.1
						34
						52.3
Kerala	Teachers	4	20	2	10	3
						15
						11
						55
Calicut	M.Phil	-	-	-	-	-
						-
						-
						-
Calicut	Ph.D/Post doc	1	1.7	6	66.7	7
						36.7
						21.9
						18.8
Cochin	Teachers	1	3.1	7	21.9	8
						18
						56.3
						32
Cochin	Sub-total	2	1.99	35	34.7	6
						5.9
						58
						57.4
Cochin	M.Phil	-	-	1	20	4
						80
						5
						100
Cochin	Ph.D/Post doc	10	13.9	10	13.9	3
						4.2
						49
						68.1
Cochin	Teachers	1	5	11	5	18
						90
						20
						100
ALL	Sub-total	11	11.3	12	12.4	3
						3.1
						71
						73.2
ALL	Teachers	37	12.5	65	21.9	14
						4.7
						181
						60.9

ALL

largest help. M. Phil students of Cochin get only 20%. Among the Ph.D/ Post-doctoral students, Cochin university with 52.8% get the highest help. In Calicut university it is 35%. Calicut university teachers get 46.9% help but teachers of Cochin university only 10%. This great inadequacy in initiation is evident in document procurement.

3.9.4 Question No. 9.4 is given to know which library-university or departmental library helps in document procurement.

3.9.4.a Help from University library

Table 22 shows that only 14.3% of M. Phil students in Kerala university are using university library in procuring documents not available in their libraries. M. Phil students of Calicut and Cochin are not using this facility at all. Among Ph.D/ Post-doctoral students Kerala university with 27.7% make the largest use and Calicut university with 1.7% are the least users. Among teachers Kerala university 20% and Calicut university ie. 3.1% make use of this service.

Lack of initiation in all university libraries is quite clear.

3.9.4.b Help given by Departmental libraries

The M. Phil students of Calicut university has 66.7% help in document procurement by the departmental library.

FIGURE: 18 PERCENTAGE OF RESEARCHERS ACCORDING TO THEIR ATTEMPT TO GET TRANSLATIONS BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN.

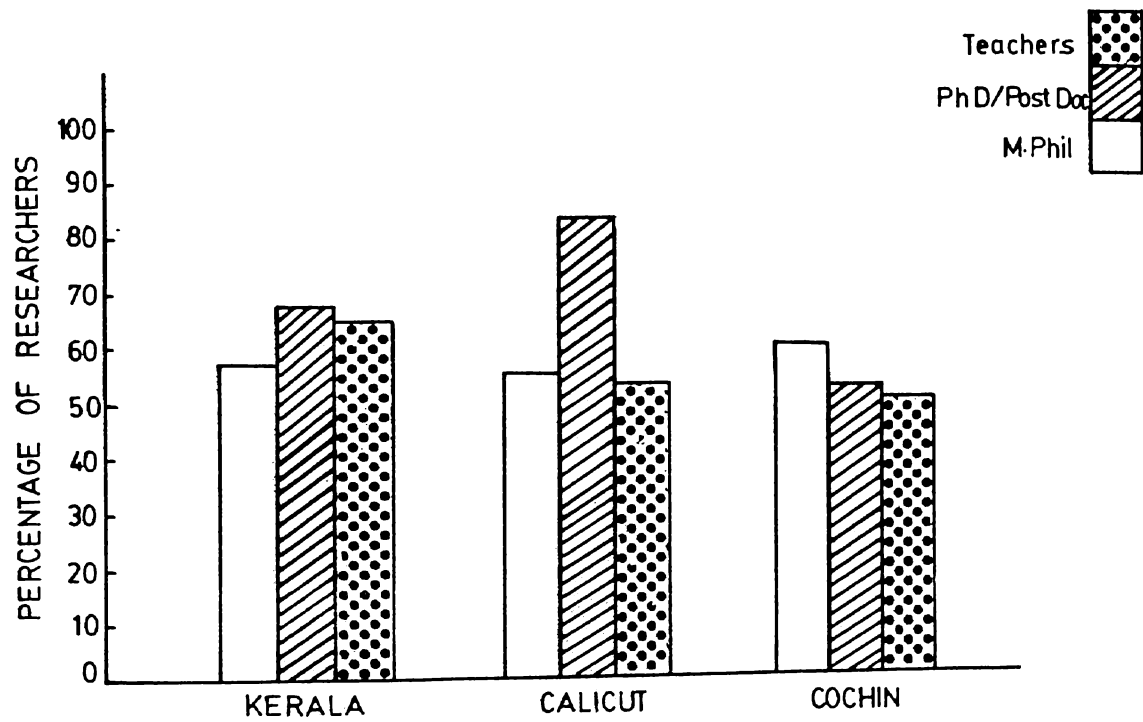


Table 23

DISTRIBUTION OF RESEARCHERS ACCORDING TO THEIR ATTEMPT TO GET TRANSLATION BY TYPE OF

UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	Trying No.	%	Not Trying No.	%	Not available No.	%	Total No.	%
Kerala	M.Phil	8	57.2	3	21.4	3	21.4	14	100
	Ph.D/Post-doc.	44	67.7	19	29.2	2	3.1	65	100
	Teachers	13	65	5	25	2	10	20	100
	Sub Total	65	65.7	27	27.3	7	7.0	99	100
Calicut	M.Phil	5	55.6	2	22.2	2	22.2	9	100
	Ph.D/Post-doc	50	83.4	5	8.3	5	8.3	60	100
	Teachers	17	53.1	13	40.6	2	6.3	32	100
	Sub Total	72	71.3	20	19.9	9	8.9	101	100
Cochin	M.Phil	3	60	2	40	-	-	5	100
	Ph.D/Post-doc.	38	52.8	15	20.8	19	26.4	72	100
	Teachers	10	50	8	40	2	10	20	100
	Sub Total	51	52.6	25	25.8	21	21.6	97	100
ALL		188	63.3	72	24.3	37	12.5	297	100

For M. Phil students of Cochin university it is only 20%. Among the Ph.D/ Post-doctoral students, Calicut university ie. 36.7% get the largest help in document procurement and in Cochin university it is only 13.9%. For teachers, it is 21.9% for Calicut and only 5% for Cochin. Initiation is called for for this service.

3.10 Translation

Question 10.1 is to assess the use of translation in research activities.

Table 23 reveals that M. Phil students of Cochin university are the largest group trying to get translations 60%. The M. Phil students of Calicut university are the least ie. 55.6%. Among Ph.D/ Post-doctoral students, Calicut has 83.4% and for Cochin it is 52.8%. Sixty five percent of teachers in Kerala are the highest group while Cochin has 50%.

3.11 Institutions helping in document procurement

Question No. 11.1 is put to find out the national/ regional organisation that helps to get copies of documents or translations.

Among M. Phil students, 21.43%, 17.85%, 7.14% get help from INSDOC, New Delhi, INSDOC Regional Centre, Bangalore and IISc, Bangalore respectively. Among

FIGURE: 19 PERCENTAGE OF RESEARCHERS HAVING ACQUAINTANCE WITH INFORMATION TECHNOLOGY BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA CALICUT AND COCHIN.

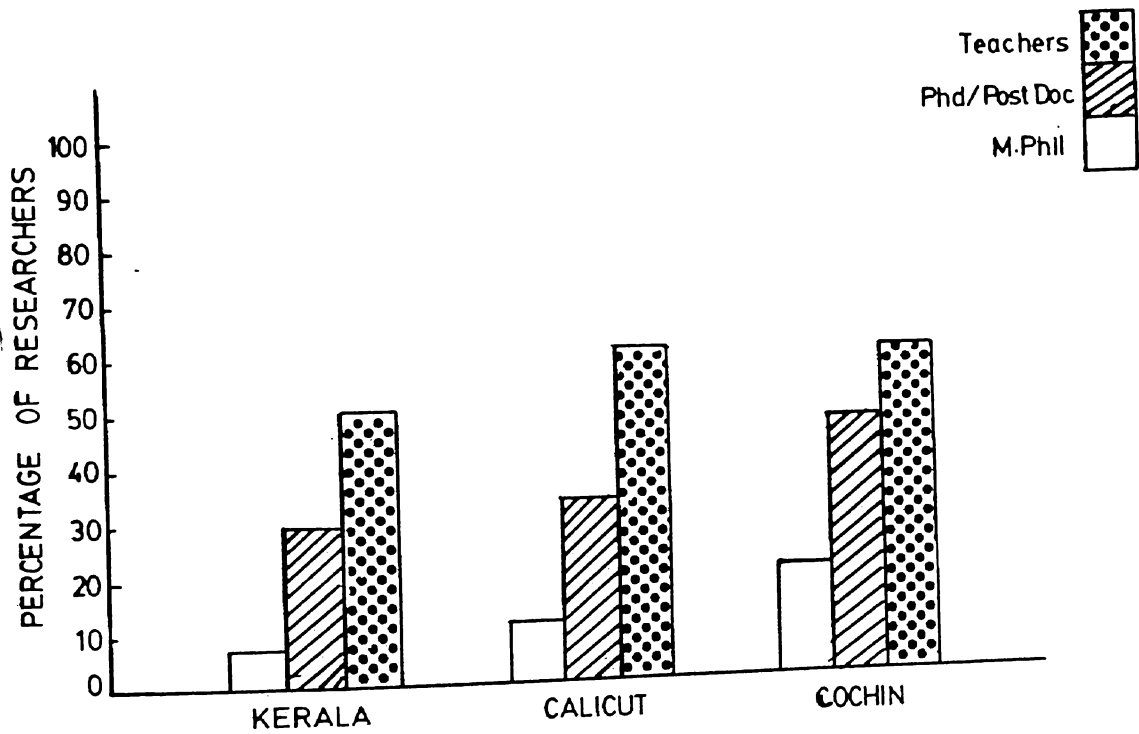


Table 24

DISTRIBUTION OF RESEARCHERS HAVING ACQUAINTANCE WITH INFORMATION TECHNOLOGY
BY UNIVERSITY AND TYPE OF RESEARCHERS

Name of University	Type of Researchers	Acquainted No.	%	Not acquainted No.	%	Not available No	%	Total No.	%
Kerala	M. Phil	1	7.1	6	42.9	7	50	14	100
	Ph.D/Post-doc	19	29.2	46	70.8	-	-	65	100
	Teachers.	10	50	6	30	4	20	20	100
	Sub-total	30	30.3	58	58.6	11	11.1	99	100
Calicut	M. Phil	1	11.1	8	88.9	-	-	9	100
	Ph.D/Post-doc	20	33.3	40	66.7	-	-	60	100
	Teachers.	20	62.5	12	37.5	-	-	32	100
	Sub-total	41	40.6	60	59.4	-	-	101	100
Cochin	M. Phil	1	20	4	80	-	-	5	100
	Ph.D/Post-doc	34	47.2	30	41.7	8	11.1	72	100
	Teachers.	12	60	7	35	1	5	20	100
	Sub-total.	47	48.5	41	42.3	9	9.3	97	100
ALL		118	39.7	159	53.5	20	6.7	297	100

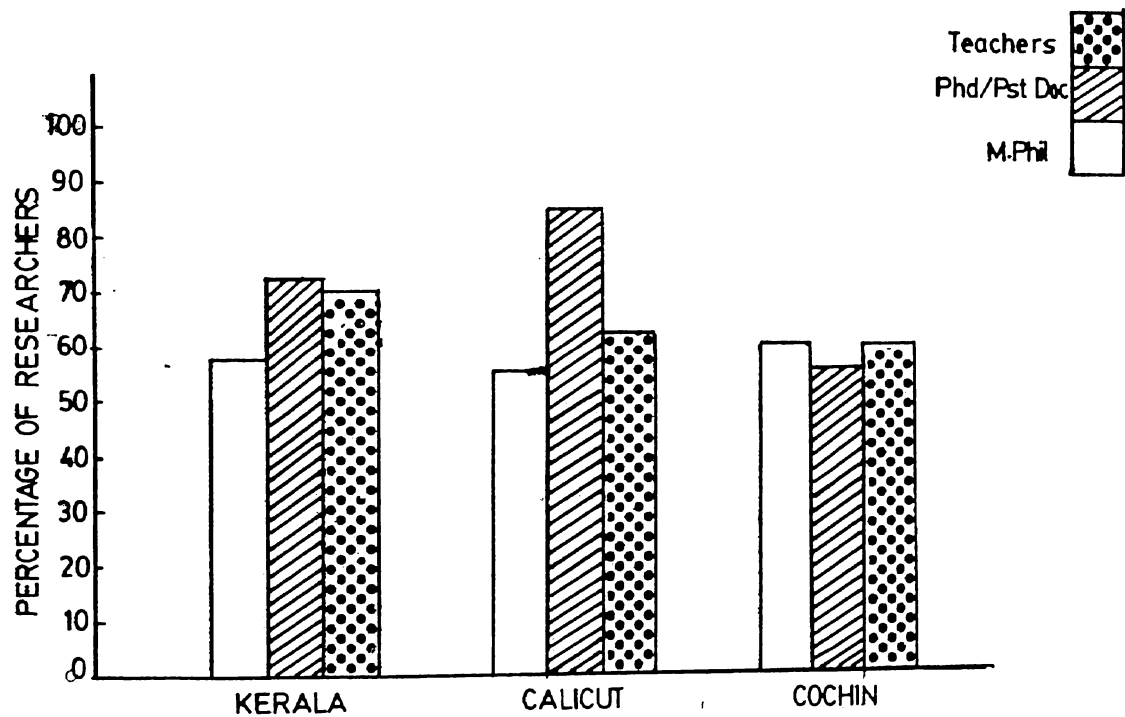
teachers, 77.8%, 83.3% and 25% get help of INSDOC, Delhi, INSDOC Regional Centre, Bangalore and IISc, Bangalore respectively. Among Ph.D/ Post-doctoral fellows, 16.75%, 55.84%, and 16.75% use the services of INSDOC, Delhi, INSDOC Regional Centre, Bangalore and IISc, Bangalore respectively.

3.12 Information technology

Table 24 shows that only one M. Phil student is acquainted with modern information technology. Regarding Ph.D/ Post-doctoral students, 47.2% in Cochin, 29.2% in Kerala have acquaintance with modern information technology and its application in library field, 62.5% teachers of Calicut university have largest acquaintance and 50% teachers in Kerala. Inadequacy of knowledge in modern information technology in library field is evident.

3.12.1 Question No. 12.1 is to know the details in application of information technology. But only 128 out of 297 researchers (43.10%) responded to this question. Most of the researchers do not have a clear idea on information technology. But they mention that they prefer automation of libraries.

FIGURE: 20 PERCENTAGE OF RESEARCHERS ACCORDING TO THEIR NEED FOR ACQUAINTANCE WITH THE METHODOLOGY OF LITERATURE SEARCH BY LEVEL OF RESEARCHERS IN THE UNIVERSITIES OF KERALA, CALICUT AND COCHIN



DISTRIBUTION OF LITERATURE SEARCH BY UNIVERSITY AND									
Name of university.	Type of Researchers	No.	Required %	Not Required No.	Required %	Not Required No.	Not available %	Total No.	%
Travancore	M.Phil	8	57.1	6	42.9	-	-	14	100
	Ph.D/post-doc.	47	72.3	18	27.7	-	-	65	100
	Teachers	14	70	4	20	2	10	20	100
	Sub Total	69	69.7	28	28.3	2	2.0	99	100
Calicut	M.Phil	5	55.6	1	11.1	3	33.3	9	100
	Ph.D/post-doc.	51	85	5	8.3	4	6.7	60	100
	Teachers	20	62.5	9	28.1	3	9.4	32	100
	Sub Total	76	75.3	15	14.9	10	9.9	101	100
Cochin	M.Phil	3	60	1	20	1	20	5	100
	Ph.D/post-doc.	40	55.6	18	25	14	19.4	72	100
	Teachers	12	60	5	25	3	15	20	100
	Sub Total	55	56.7	24	24.7	18	18.6	97	100
ALL		200	67.3	67	22.6	30	10.1	297	100

1.13 User education

Question No. 13.1 is to collect information on the need for conducting user education programmes on a periodical basis and Question No. 13.2 is meant to collect information on who should conduct user education programme.

It is shown in Table 15 that among M. Phil students those of the Cochin university is. 60% require the highest need for acquaintance with the methodology of literature search. Among Ph.D/ Post-doctoral students, Calicut university with 85% show the highest need for acquaintance with the methodology of literature search and Cochin university shows 55.6%. Kerala university teachers with 70% and Cochin university with 60% show the need for acquaintance with the methodology of literature search. Generally, 200 (67.3%) out of 297 researchers in various universities state that they need to get an acquaintance with the methodology of literature search. This felt need is to be catered for.

Question No. 13.2 is to get suggestions on how to conduct user education programmes.

In advanced countries user education is a part of the regular academic programmes at all levels of education. An instructional programme for the researchers will help them to study organisation, operation and services, and information of the agency for such training was sought.

	10	50	4	20	-	6	30	20	100
s	10	50	4	20	-	-	-	-	-
	41	41.4	29	29.3	2	2	27	27.3	99
	3	33.3	-	-	1	11.1	5	55.6	9
ost-doc.	37	61.7	18	30	3	5	2	3.3	60
rs	12	37.5	3	9.4	1	3.1	16	50	32
l	52	51.5	21	20.8	5	5	23	22.8	101
	3	60	2	40	-	-	-	-	5
ost-doc.	25	34.7	22	30.6	1	1.4	24	33.3	72
rs	9	45	3	15	1	5	7	35	20
al	37	38.1	27	27.8	2	2.1	31	32	97
	130	43.8	77	25.9	9	3.1	81	27.3	297

3.13.2.a Library should conduct annual user education programme

According to Table 26, 60% M. Phil students in Cochin university desire that library should conduct user education programme. The same need is expressed by 61.7% of Ph.D/ Post-doctoral students in Calicut, 34.7% in Cochin and 41.5% in Kerala universities. 50% teachers in Kerala university, 37.5% in Calicut and 45% in Cochin universities made this request.

3.13.2.b INSDOC should conduct user education programme

40% M. Phil students in Cochin and 14.3% in Kerala desire INSDOC to conduct the programme.

3.13.2.c University Library with INSDOC or UGC or CSIR or and the concerned University Department should conduct User Education Programme

11.1% M. Phil students of Calicut university would like this type of user education programme. Among Ph.D/ Post-doctoral students, 5% of Calicut university the same type of user education in university libraries. Among teachers, 5% in Cochin university, 3.1% in Calicut university also would like user education programme in association with INSDOC and others in libraries.

3.14 Suggestions

Question No. 14.1 is to elicit suggestions from the researchers to develop a more satisfactory system to meet library requirements. A total of 152 out of 297 (51.18%) researchers have responded to this question a summary of which is given below:-

3.14.1.a Suggestions from Kerala University Library

- 1) Avoid duplication of journals and books in the departmental and university libraries.
- 2) Library staff should be more efficient and serviceable.
- 3) Avoid delay in receipt of photocopies from INSDOC even after payment.
- 4) Have microfiche copies for very costly journals
- 5) Departmental libraries may be computerised
- 6) Important journals- Journal of Indian Chemical Society and Talanta, Tetrahedron, Thermochimica Acta, Journal of Food Technology etc. should be subscribed to in the departmental library
- 7) Inter-library loan facility to be improved
- 8) Subscribe or update Union Catalogue of Scientific Serials in India. Provide union catalogue of journals available there
- 9) More library funds for purchase of books and journals.

- 10) There should be a means to obtain cheaper photocopies of articles on inter-university basis.
- 11) Start a system to compile bibliographies on request and in anticipation of the researchers undergoing in this university.
- 12) Centralise subscription of journals so as to minimise duplication.
- 13) Library should provide facilities or systems to give details regarding on-going research at international level.
- 14) Establish inter-library loan in all departmental libraries.
- 15) Welcome computerisation of departmental and university libraries.
- 16) Provide user education and literature search devices for researchers.
- 17) Arrange translation facilities in association with INSDOC in various university libraries.

3.14.1.b Suggestions from Calicut University Library

- 1) Strengthen books and periodicals collection in the University library system
- 2) Central library should be kept open from 8.00 A.M to 11.00 P.M.

- 3) The documentation section should be established in a full fledged manner.
- 4) Provide xerox copies of the required articles in the central library in Calicut university.
- 5) Library should assist researchers in getting reprints of articles.
- 6) Library ~~staff~~ should help the researchers in literature search.
- 7) Books, journals and shelves and reading tables and chairs must be kept free from dust.
- 8) Reprints needed to the students should be provided by the library and after use it can be left in the library itself.
- 9) There is undue delay in getting foreign journals like Nature, Physics today etc.
- 10) There should be regular rectification of shelves of back issues of journals.
- 11) Subscribe journals like Atom Index, Physics Abstracts etc. in libraries.

3.14.1.c Suggestions from Cochin University Library

- 1) Make arrangements for getting reprints in library
- 2) Start proper documentation service in the library
- 3) Arrange for xerox copies of scientific papers from other libraries at a nominal charge instantly.

- 4) Avoid duplication of journals and books
- 5) Arrange inter-library loan service through libraries and individual should never be charged.
- 6) Automate the libraries
- 7) Procure back volumes of important journals
- 8) Establish a centralise computer system among university libraries in Kerala.
- 9) The journals are to be subscribed in consultation with the students, research scholars and teachers.
- 10) Establish a library equal to IISC, Bangalore in Kerala state.
- 11) Increase the library hours
- 12) Establish library cooperation among university libraries in Kerala
- 13) Periodicals of running year should be tied up separately and kept so that none will be missed. Afterwards it can be bound permanently and kept in the stack of back issues.

Chapter IV

CASE STUDY IN SCIENCE

For conducting case study fifteen respondents from the three universities were selected at random. A questionnaire was administered to each one in person and their responses were recorded on a tape recorder. The responses were then codified for finding the results.

In the three universities under study, it is found that researchers take too much time in completing their research for taking doctorate degrees.

¹
Saxena (1986) expressed the opinion that in Western countries, two or three years are enough for getting a doctorate in any subject, while in India, the average time taken is from 4 to 4½ years. One reason for this delay may be the difficulty experienced by researchers in literature search. This hypothesis is based on the observation that in the Western countries, the education is more library-centred and students normally get considerable experience in literature search prior to their taking up doctoral level research. The unnecessary delay in completion of research in our universities can be avoided only

1. Librarian's role as a guide to research workers. In R.S. Saxena. Information retrieval techniques and reference sources and tools in pure and applied sciences, Agra: Y.K. Publishers, 1987, p. 24.

through introducing library-centred teaching. This should be a joint effort of teachers and librarians. They should inculcate the habit of use of library regularly to solve various problems.

The investigator wanted to study a few cases of researchers in details so as to find whether they have had sufficient exposure to the methods of systematic literature search and whether their prior knowledge or ignorance about systematic literature search has influenced their actual research output.

In addition to survey by questionnaire and interviewing various categories of researchers, a case study was conducted with a population of 15 researchers. Equal representation was given to researchers of each of the three universities. The results are given below:-

4.1. Case study 1

This is about a Professor of Chemistry. Having been a teacher for about 34 years, he has acquired long research experience. Himself being an authority in his field, he is not usually consulting his colleagues in his own research activities, but others take his consultations. He knows

German, Russian etc. Further he takes the help of INSDOC for getting translations and in the supply of photocopies. Literature search is more done in the beginning and at the end of a research work. He collects reprints from authors for his research work. He finds the collection of departmental library better for his research work, although he depends on the university library for use of the Chemical Abstracts. This teacher's specialisation has got relation with the topics chosen by his research students. He attends various national and international seminars. He had prior knowledge in methodology of literature search as he had his higher studies abroad which helped him to finish his research work in the minimum time limit. This training helped him in his information search here also. He is a member of national and international Chemical Associations. This close contact with the peer groups helps him much in his research work. He has a good number of papers published in his research field.

4.2 Case study 2

This relates to a research student in Chemistry. He has been doing research for 6 years. He takes translation facility and collects photocopies from INSDOC, Delhi. Research topic is selected by himself with due relevance to his guides specialisation. Topic was selected in the begi-

duplication of his topic of research with the help of abstracts and in consultation with his guide. He learned to use Chemical Abstracts himself. He does not refer any old thesis for his study. Literature collection was done with the help of his guide. He attended a course on computerisation with relevance to his topic for 15 days. He has by now a background in doing reference and search. So far he has published in various journals ten papers relevant to his discipline. This necessitated also his learning literature search. Though he is familiar with INSDOC's services he is not well aware of NISSAT and its programmes. He stated that literature search took not less than 15 months of his total time for Ph.D. research. Writing will take another one year. Literature search was done more in the starting and in the middle of research. He is a member of a national association in his discipline. He found the departmental library useful upto 10% and the university library for 20%. He seeks help of various friends working in I.I.Sc and other research institutions for reprints and photocopies of needed articles.

4.3 Case study 3

This is a teacher in Physics department who started his Ph.D. research in 1984 and finished in 1989. The topic

for research was selected by himself; on the way to a training programme abroad, probably from interaction with the fellow travellers. He was able to get guidance in literature search from outside. A proper user education while abroad helped him to finish his higher studies without waste of time. His topic does not have much relevance to his guide's specialisation. His past training in literature search helped him to use the various sources of information and basic tools in his specialisation much better. Also he refers relevant books and articles for their reference. He never took any help in literature search from his guide. He made use of indexes, abstracts, and library catalogue for his search for information. I.I.Sc, Bangalore was very useful to get photocopies and relevant articles of his interest. He used others' theses only for knowing the model of writing. He presented two papers during his research tenure and attended some seminars. He also got his guide's help to present his thesis in a better way. He holds also discussions with other experts. He did not get any translational help from anywhere. He was taught the use of cumulative and other indexes to periodicals by the librarian. He also got help from IISc, Bangalore for research work. Literature search was done more in the writing stage and in the beginning. He found

the collections of the Departmental library and university library helpful. Since he got help from outside, for literature search and its complexities, he was helped much to finish his work within 5 years. He is not a member of any international physics associations.

4.4 Case study 4

This pertains to a research scholar in Physics. He is doing research since 5 years. He took the help of various libraries outside Kazala for his literature search. 3 to 6 months search was done to get an idea of topic. He selected the topic of research with the help of his guide and the topic has relation with the guide's specialisation. He selected his topic and checked with abstracts and searched library materials to check duplication. He consulted his colleagues and close associates in his research field. He did not use any bibliography of theses to check duplication of his work. He uses the facilities of reprography and translation service and makes use of catalogue for literature search. He states that collection is not so current in the library. He attended a few national seminars and got chances to communicate and discuss with others on his research topic. He also makes discussions with other

friends and colleagues. He takes help from INSDOC for document procurement. He is not much aware of NISSAT and its activities. Literature search was done much in the beginning and in the writing stage. Totally he spent a period of one year for literature search. He hopes to finish his work in 6 years. He is not a member of any physics associations. He has four published papers to his credit. He never got any training in literature search, and so was not able to do literature search systematically. He is not much acquainted with subject bibliographies, patent index, subject index and its use in research are brought to his notice by the concerned librarian in his departmental library. He has got no idea of union catalogue nor with the application of information technology in library and information science field. He also does literature search from paper to paper by referring various references.

4.5 Case study 5

This is about a Professor in Mathematics. Sometime topics will be selected on any emerging problems and articles relevant to that problem will be collected. From papers to papers references will be broadly done unless the number of references will become too much to manage. Further references will be done to Mathematical Review, American Mathematical Society Index etc. This reference will

help to find out the duplication of any work already done and so on. He is not much interested in referring any union catalogue. In the initial and writing stage, literature search will be heavy. He used to present papers in seminars and conduct discussion with personnels in his field of specialisation. This will help him a lot to conduct his literature search properly. He will collect reprints from concerned authors and photocopies from INSDOC. He did not have any training in literature search. He is a member of national and international mathematical associations.

4.6 Case study 6

This study also pertains to a research scholar in Mathematics. He is working on his topic since 7 years. He took 3 years for literature search and after 3 years only he could get a clear idea on his topic. Topic is selected with the help of guide and has connections with guide's specialisation. Topic was selected and the duplication checked with the help of Mathematical Reviews. Review will give a clear idea and a critical assessment of the study. He made use of few theses for his study. He never attends

any courses on research methodology. He never gets any chance to present any paper on his topic of research. He never takes any translation for his research work. He did not know about NISSAT and its activities. He took help of INSDOC for document procurement. Literature search was done much in the beginning and writing stage. He finds the collections of departmental and university library useful for his research work. He has no idea of union catalogue. He will do literature search in a haphazard manner from paper to paper by referring various references. So his methodology of literature search is not systematic. This could be one of the reasons for not finishing his search within 7 years.

4.7 Case study 7

A research scholar in Marine Science department, he is doing research for 4 years. He makes use of abstracts for knowing material on his topic. The problem was decided with the help of guide and has relation with guide's specialisation. He has not used translation services of INSDOC. He seeks the help of his friends working in various special libraries for document procurement and consults friends working in the field. Research methodology was given with the guide. Librarian also helped him to get an idea of various tools for

seeking information on his topic of research. Literature search was done much in the end and beginning of research. The duplication of topic was checked only with the help of abstracts. He used to do literature search by referring the references given in the end of papers and go to other papers for further references. He does not know the use of union catalogue. He likes automation of libraries though he did not have a deep idea on information technology and its various activities in library. He made use of few relevant theses and its bibliographies for his research work. INSDOC's services were made use of to get photocopies. He never got any training in literature search. He has presented three papers. He hopes that he will be able to finish his research work in another year.

4.8 Case study 8

A Senior Research Fellow in Zoology, he selected the topic of his Ph.D. research in consultation with his guide. His doctoral programme has given him the necessary practical experience in literature search. Old theses were used for literature search and so references were easy to be done. Only abstracts were made use of to check duplication.

Reprints were received from authors. INSDOC supplied photocopies. Translation was never used since it is quite costly. Communication was done with persons in the same field. A few papers are published. He never got any training in research work except from his colleagues and guide. Since he was not having a clear idea of literature search, he took more than five years to finish his Ph.D. programme. He is a member of a national Zoological Association.

4.9 Case study 9

This study relates to a Professor of Zoology who has about 30 years experience and is doing projects for many years. She is the editor of several journals. The topic for research was selected from personal collections. Booklets will reach this expert with details of published papers and abstracts. INSDOC is very useful for document procurement. She is a regular account holder of INSDOC for ordering photocopies. Current Contents are very useful for her specialisation. She used to present papers in various seminars. The references given at the end of papers are very useful for literature search for her. There will be communication and discussion with experts in her field. This will help her to collect more information in various topics. Literature search is done more at the beginning and in the writing stage. The researcher depends on libraries outside

the State for major works. She had visited developed countries for advanced research. While abroad she had training in literature search. She stated that her training abroad surely helped her to finish her research work abroad within the time limit and to have an idea on each and every tool of information available in the library. This helps her to do search better than before.

4.10 Case study 10

A lecturer in Statistics, he is doing research since 4 years. He had access to bibliographic instruction during his M.Sc. course. He has selected the topic of research with the help of his guide. He held discussions with experts in his field. He started by referring relevant articles and references given at the end. Thus cross reference of articles is used as a better method for literature search. Further he took the help of Abstracts in his subject. He requires more literature search in the beginning and end of his research work. He has presented one paper for a seminar. Relevant materials in his topic of research in the departmental and university library is very inadequate. He also depends on his colleagues, experts, authors and INSDOC for document procurement. He expects to finish his research within 4½

years. He agreed that his past training in literature search at post-graduate level helped him much in his search for information. This training is a time saving device for his research programme.

4.11 Case study 11

A research scholar in Statistics doing Ph.D. work since 3 years. The topic was selected with the help of the guide. He has got some knowledge of literature search during his P.G. course and from the guide. He makes use of abstracting services in Statistics to find out the relevant papers. This will help him to check any duplication of his thesis. His topic of research has got relevance with the guide's specialisation. He is making use of references given at the end of relevant papers for literature search. He stated that abstracts will help him to check any duplication. He will collect relevant papers from authors and experts and photocopies through INSDOC. Departmental and University library does not have adequate material in his topic of search. He had an opportunity to get a training in literature search at his P.G. level. So he is able to proceed in his work without much difficulty. He hopes that he will be able to finish his work within four years.

4.12 Case study 12

This study is related to a research scholar in Zoology and Bio-chemistry. (Inter-disciplinary subject). He did not use translation facilities. According to him, it is costly. He took the photocopying services of INSDOC. He studied the methodology of literature search- abstracting , bibliography- from colleagues, experts and those who finished research and from his guide. He does not get any chance to attend any training in literature search or bibliographic instruction in his discipline. His topic of research was selected with the guidance of guide. Literature search was much done in the end of research. He checked duplication of his topic by discussion, with guide, colleagues, experts etc. He hopes that he will be able to finish his work within 5½ years.

4.13 Case study 13

This study is about a research scholar in Botany who has research experience of 1½ years. She got help from the guide to select the topic. She started literature search by referring key terms relevant to her topic in abstracts. She has got help from guide to refer to the abstracts. She had a chance to attend 2½ hours classes in her P.G. level

regarding research methodology. She makes use of other theses for her literature search. She never attended seminars or presented papers. She used to hold discussions with her colleagues regarding research work which is useful. For translations she takes the help of INSDOC. She can use the translated abstracts from the abstracts. A formal training at her P.G. level is helping her to search for the exactly relevant tools in her disciplines. She stated that this formal training is a time saving device in her literature search. She hopes that she will be able to finish her research work within 4 years.

4.14 Case study 14

This study refers to a research scholar in Botany, doing research for 2½ years. Her specialisation is in Pepper. Various aspects studied will be referred in other plants. That will be applied to pepper. Other theses are made use of in her study. Topic was selected by Guide. There is a partial relevance for her topic to the guide's specialisation. Somebody left her topic after one years research which topic was given to her by the guide. Guide helped her to do literature search. Librarian also helped her. She made use of bibliography for research work.

Discussion with colleagues, communication with experts were done which helped her a lot in her work. She attended M. Phil course and so she had access to research methodology at M. Phil level. She did not make use of translation facilities. She wrote to INSDOC for help. But she never succeeded in her attempt. Literature search was done more at the writing stage of thesis. A major part of literature search done in the beginning will become redundant later when we go deep into the research. She got good collection in departmental library. But only an average collection in University library. It is said that Biological Abstracts is stopped in Botany department of University of Calicut because of shortage of fund. She did good reference work at TNAU, Coimbatore, IARI, Delhi etc. She never takes any help from IISc, Bangalore. She is doing research since 2½ years. She wishes to finish within 4 years. She is sure that her past training at M. Phil level will help her to finish the work without delay.

4.15 Case study 15

This study relates to a research scholar in Botany. Topic was selected by guide. She is doing research in pathological aspect of pepper. Communication in the specialised field will help to check duplication. A few theses were useful to her in her research. For literature collection, communication from scientists and colleagues was much

useful. She did P.G. in Sociology which helped her to get an idea of bibliographic tools. She never wrote any paper. She attended seminars and did discussion with others in her field and was useful for her study. She never used translation of articles because it is costly. For photocopies, she never approached INSDOC, IARI, Delhi is much helpful in providing the needed photocopies. Literature search was done much in the writing stage. There is a good collection of materials in the departmental library and in university library. TNAU, Coimbatore., IARI, New Delhi are very useful in literature search. She is doing research since 3 years. She hopes that she will be able to finish her work within 4 years.

4.16 Conclusion

A case study consisting of 15 cases is conducted to collect additional information on their method of literature search and how they meet their information requirements.

The findings are as given below:-

1. One researcher has got knowledge of foreign languages like German, Russian, etc.
2. Three teachers attended training course in methodology of literature search or bibliographic instruction while abroad. This helped them in their later years of library use in India to save their time.

3. Five researchers have prior training in literature search or bibliographic instruction.
4. One researcher has training in computer technology with relevance to his subject.
5. Six researchers have no prior training in literature search.
6. Communication with experts in the field is more time saving.
7. Five researchers stated that training in literature search help to get an idea on each and every tool of information.
8. Three researchers stated that they will do paper to paper search with cross references.
9. Four researchers were doing research since, 5, 5½, 6 and 7 years and the peculiarity is that they don't have any chance to attend any training in literature search.
10. Five researchers who had training in literature search will take a maximum of 4 to 4½ years to finish their research programme.
11. Six researchers stated that indexes, abstracts and reviews will help to check duplication of research.
12. Seven researchers (46.7%) found that literature search was done much in the beginning and end of research work.

13. Six (40%) researchers were able to publish a few papers which is an indication of a training in literature search at a lower level.
14. None of the researchers under study uses 'Bibliography of Doctoral Dissertations' published by Association of Indian Universities, New Delhi for checking duplication of topic.
15. Majority of the researchers were not aware of NISSAT and its activities.
16. A good number of researchers do not give much importance for library catalogue in literature search.
17. Most of the researchers do not use translation service for research work.

Out of the 15 researchers in case studies, 9 researchers have a training in literature search in one form or other. Out of them, 5 researchers had bibliographic instruction at P.G./ M. Phil level. They hope that they will be able to finish their research work between 4 and 4½ years. Since there is no training in literature search, seven researchers were not able to finish their research ranging from 5 to 7 years.

A training in user education while abroad helped the three teachers to finish their work without waste of time. Such a training abroad definitely helped them to do their

research work in a better manner in India also. Since they have a background of tools for research in their discipline, they were able to publish a number of papers.

The survey conducted by the investigator shows that 67.3% researchers of the three universities are demanding a training in literature search (vide Table 25, Chapter III Analysis). It is also indicated that in the case studies, out of 15 case studies, 6 (40%) do not have any training in literature search. This indicates an inadequacy of systematic user education in various universities. So the investigator has a valid argument to give user education in a systematic manner to researchers.

SUMMARY AND CONCLUSION

The purpose of the investigation was to study the pattern of literature search by the science researchers of Kerala, Calicut and Cochin universities.

5.1 Methodology

The samples for the study consisted of 297 researchers identified from the three universities. Questionnaire was the major tool used for the study which was supplemented by interview, discussions, observation and case studies.

5.2 Hypotheses tested

The following were the hypotheses formulated for the study:-

- 1) Research workers are not making the optimum use of the information sources available in the libraries.
- 2) Research workers are generally ignorant of the various information sources and therefore their literature search leads to waste of energy and time, and
- 3) More exposure to user education, will lead to increasing the research worker's efficiency in literature

search and document procurement.

The data needed to test the validity of the hypotheses were collected through the following sources.

1) Questionnaires collected from 297 researchers in the three universities of Kerala, Calicut and Cochin.

2) Schedule followed in the interview held with 25 M. Phil students/ Ph.D/ Post-doctoral students/ teachers.

3) Schedule followed in the interview held with 25 librarians in each university.

4) Discussions held with science experts, library science experts and others.

5) Personal observations by the investigator of collections and services of libraries which the researchers' search for information.

6) Case studies done on representatives of researchers belonging to the Ph.D/ Post-doctoral and teacher groups of Kerala, Calicut and Cochin universities.

The data gathered through questionnaire was analysed and studied carefully. The percentage of the response to the questionnaire was calculated to understand the use of various collections and services and the pattern of search for information. As the population was large, only per-

centage was calculated for analysis.

The analysis of the data (Chapter III) helped to answer the various questions raised in the study and to test the tenability or otherwise of each of the hypotheses.

The analysis of the data substantiated hypotheses I that the information sources were not fully used. A large per centage of the researchers were not making the maximum use of information sources available in the libraries.

Hypotheses II, that the ignorance of the research workers about the facilities and services in the libraries and defects in their search lead to waste of energy and time was also substantiated.

The third hypothesis namely that provision of user education will increase the research worker's efficiency in literature search and document procurement was also proved by the study.

5.3 Objectives

The objectives of the study are given below:-

- 1) To understand the background of the researchers in the Science faculties of Kerala, Calicut and Cochin universities.
- 2) To know how they search for the documents in the

departmental libraries and university libraries.

3) To evaluate the sufficiency of collections and services in the departmental, university and other libraries.

4) To understand the document procurement methods at the local and national level.

5) To know the extent of use of translation facilities

6) To find out the need for user education

7) To get suggestions for the better organisation of the libraries.

The study has given a clear image of the background of the researchers, their search for documents, document procurement methods, and use of translation facilities. It has also revealed several drawbacks of the departmental and university libraries. Areas which need improvement were also pointed out.

Detailed analysis of the questionnaire is given in Chapter III by using 26 tables and their text. By way of illustration, a few areas where inadequate use of library services and facilities, are given here:-

1) use of library catalogue, 53.5%

2) using union catalogue, 17.2%

3) making use of inter-library loan, 19.2%

4) help from the University library for document procurement, 12.5%

5) difficulty in getting required information from the library catalogue, 47.5%

The one thing that is very glaring in the study is need for systematic user education in all the three universities. It is also significant that 67.3% of the researchers have requested for it. So the investigator is of strong opinion that user training should be provided, covering topics like

- 1) personal assistance by library staff
- 2) use of micro-documents
- 3) use of subject bibliographies, indexes, library catalogue and catalogue entries
- 4) Union catalogue
- 5) classification system
- 6) indexing and abstracting journals
- 7) inter-library loan and photocopying services
- 8) organisations like Association of Indian Universities, INSDOC, NISSAT
- 9) scientific institutions and library services in various disciplines like National Laboratories, IIT's, Indian Institute of Science, ICAR and ISRO.

Besides, the investigator has observed that information

technology should also be part of the user education because, techniques and tools in library science have undergone vast changes. Information technology has revolutionised many library practices. The library system of universities must be computerised and researchers should be equipped to obtain maximum benefit of such services. The need for in-service training for library staff is also stressed.

It will be useful to review the effect of introducing user education at regular intervals annually or at least once in three years.

The study of the relevant published literature, detailed analysis of the data, discussion and suggestions of experts, researchers and librarians and careful observation by the investigator have helped to get a deep insight into the existing library situation and the pattern of literature search by the Science researchers in the three universities of Kerala, Calicut and Cochin. As a result, several suggestions for improvement of literature search and library service of these universities have evolved. The following recommendations are accordingly made.

5.4 RECOMMENDATIONS

I LIBRARY SERVICES

- 1) Document procurement services such as inter-library loan.

photocopying facility, reprint services, microfilm, microfiche and documentation must be strengthened in the libraries.

2) Researchers have complained of their difficulty in getting translation at cheap rates. Universities should utilise the services of foreign language departments to obtain cheap translations.

3) Sufficient publicity should be given by the library about the services of INSDOC, IISc., DRTC, NISSAT, National Science Information Centre, Association of Indian Universities and other agencies which give valuable help to researchers.

4) Efforts must be made to build up a photocopy and reprint collection by enlisting the co-operation of the users.

5) Reprographic services should be available at nominal cost in the three university libraries.

6) Wide publicity must be given to all services of the library among its users, particularly the researchers. List of additions and other current informations must be displayed on the notice board. Each library must also publish a 'handbook' giving full details of the library and its services.

Researchers should be made aware of on-going researches in the Universities. Doctoral dissertations in India, and theses of the month.

II LIBRARY FACILITY

7) There must be sufficient number of seats and cubicles in

the libraries. Rooms should be ventilated and airy and documents, shelves and other furniture and premises should be kept clean and free of dust.

XIII LIBRARY COLLECTION

8) Adequate stock of journals and books must be provided.

9) Union catalogue of Scientific Serials in India and its revisions must be available in the library.

10) Duplication of research journals and books must be minimised as far as possible. Centralised subscription and purchase of books must be practised to save precious library budgets.

11) Delay in receipt of journal issues should be avoided.

IV LIBRARY STAFF

12) Every effort should be made by the library staff to educate the clientele and to render maximum service to them.

13) Refresher courses in Library and Information Science must be arranged for librarians.

14) They should be encouraged to do higher studies on deputation basis.

15) Librarian should attend seminars, publish papers and books whereby they could improve their professional knowledge and efficiency.

4.1 GENERAL

16) Further, there is urgent need for better communication between management, librarian and researcher.

17) Many valuable research journals were seen discontinued. This clearly shows the paucity of funds in all the three universities which is adversely affecting research. Adequate funds to meet the needs of higher education and research must be provided. Resource sharing programmes among the universities and among the libraries within each university will go a long way to help inadequate budget. It is unfortunate that very little resource sharing is practised by any of the three universities.

5. SUGGESTIONS FOR FURTHER RESEARCH

1) As already mentioned the study is limited to the science researchers of the three universities of Kerala, Calicut and Cochin. The investigator believes that extension of the study to the other faculties like Humanities, Social Sciences, Engineering and Medicine would yield valuable data about research in these subjects.

2) Similar studies in other universities of India could be conducted.

3) Similar studies should be conducted before formal training in user education and at least six months after training. Regular yearly evaluation of user education programmes should also be undertaken.

6 CONCLUSION

The inadequacies in the present practices of literature search and in the existing collections and services of the three universities were very vividly brought out by the study. As mentioned earlier in this chapter, the one most significant insight is the urgent need for user education programme for researchers in the three universities. The fact that researchers of all the Universities (67.3%) have asked for it (Chapter III) is also very pertinent. To be most effective, disciplinewise user education must be given.

Now there is no formal user education conducted by the library in any of the three Universities. As a result, the literature search in libraries is adhoc and improper. The research findings obtained by such faulty search cannot be fully relied upon. To have a comprehensive literature search by the researchers and resultant reliable research findings, user education in a very comprehensive and systematic manner in all the three Universities is strongly recommended.

It may be noticed that huge amounts of money are being spent for research and development in our institutions of higher education. As the study has already revealed, much of this would be a national waste if proper user education is not provided in the universities. A case study of 15

science researchers (Chapter IV) confirms the findings obtained by the questionnaire, interview, discussion and observation. Teachers who had training in user education while abroad, could do research work more efficiently in India also. Those who had training in literature search at P.G./M.Phil level reported that they anticipated to complete their research work within 4 to 4½ years, while those who did not have such training are taking longer periods. This shows that if user education is given for the researchers of the various disciplines in the three universities, their research work will be speeded up. The present extension of time, waste of money and resultant frustration of researchers could thus be avoided or greatly minimised. Then the research activities in our universities would be more productive and research findings more authentic and reliable.

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Alexander Abraham
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Calicut University, P.O.,

Dated:

Dear Sir/Madam.

I am conducting a survey of the pattern of literature search by the Researchers (Science) in the Kerala, Calicut and Cochin universities. This survey can be carried out only with your help and co-operation. I am approaching you for soliciting this help and co-operation from you. I know that I am intruding on your valuable time but as this survey would yield useful results which can be used for planning improved library service. I am sure you will bear with me and spare the time to complete and return the enclosed questionnaire.

Thanking you,

Yours faithfully,

Encl: as above

(ALEXANDER ABRAHAM)

PATTERN OF LITERATURE SEARCH BY THE SCIENCE RESEARCHERS
OF KERALA, CALICUT AND COCHIN UNIVERSITIES

Q U E S T I O N N A I R E

Literature search: For the purpose of this questionnaire means the total efforts on the part of the research scholars to search for the literature of relevance to their work such as books, monographs, articles in periodicals, standards, patents, conference proceedings, research theses and to gain access to them for reading.

1. Name of the Department:
2. Name of the researcher:
3. Topic:
4. Period/experience in research:Year months

5. SEARCH FOR MACRO-DOCUMENTS LIKE BOOKS IN THE DEPARTMENTAL LIBRARY

- 5.1. Do you consult subject lists of books (bibliographies) if any available in your departmental library?

Yes/no

- 5.2. If yes, please list them

- | | |
|----|----|
| a) | b) |
| c) | d) |

- 5.3. Do you consult the library catalogue? Yes/no

5.4 If yes, it to obtain information about

- a) Books on a specific subject of your interest
- b) Books of particular authors
- c) Books of particular title
- d) Any other (Please specify) (Please tick mark)

5.5 Please indicate the priority in respect of a,b,c and d above by marking 1,2,3, and 4 against

a) b) c) d)

5.6 Have you experienced any difficulty in getting the required information from the catalogue? Yes/no

5.7. If yes, do you get assistance from the library staff?
Yes/no

5.8. Are you able to follow the classification? Yes/no

5.9. If not, do you get assistance from the staff to locate the books required? Yes/no

5.10. Your suggestions if any for improving the technical organization (ie. classification and cataloguing) of the library.

6. SEARCH FOR MICRO- DOCUMENTS LIKE ARTICLES IN PERIODICALS, RESEARCH THESES, STANDARDS, PATENTS etc. IN THE DEPARTMENTAL LIBRARY

6.1. If you are in the habit of reading certain journals regularly, please list them.

a)	b)
c)	d)
e)	f)

6.2 Do you compile any bibliography containing the items of

relevance to your topic of research at the beginning of
your research? Yes/no

6.3 Please mention the sources that helped you in the
preparation of the bibliography.

- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

6.4 Do you regularly consult any indexing /abstracting
journals in your field?

Yes/no

6.5. If yes, please list them.

- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

6.6. Do you consult the index to volume of a journal for
locating articles required?

Yes/no

6.7. Do you consult also cumulative indices of journals
if available?

Yes/no

6.8. If yes, please list them

- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

6.9 Do you consult reviews such as Progress in
Advances in series?

Yes/no

6.10. If yes, please list them.

- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

6.11 Do you consult other bibliographies having a bearing
on your subject?

Yes/no

6.12. If yes, please list them

- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

6.13. To what extent is the departmental library sufficient for your purpose? (Give a rough percentage of your library requirements which are met by the departmental library)

Less than 25%		25 to 50%	
50 to 75%		Above 75%	

7. UNIVERSITY LIBRARY

7.1 Do you use the university library for your requirements?
Yes/no

7.2 If yes, please give an indication of the extent of using it.

a) Daily b) Twice a week c) Once a week d) occasionally

8. OTHER LIBRARIES

8.1 Do you use libraries other than the Departmental library and the University library to meet your library requirements?

Yes/no

8.2 If yes, please list them in the decreasing order of frequency.

- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

9. DOCUMENT PROCUREMENT

9.1 Do you use a union catalogue to locate materials not available in your library?

Yes/no

9.2 What steps do you take to have access to the documents required by you which are not available in any of the libraries you visit?

- a) Request on inter-library loan/Reprints
- b) Request for photocopy/Microfilm/Microfiche etc.

9.3 Do you get any help from your departmental library/ University library for procuring them?

Yes/no

9.4 If yes, which library?

- | | |
|----|----|
| a) | b) |
| c) | d) |
| e) | f) |

10. TRANSLATION

10.1 If the document you need is in a foreign language not known to you, do you try to get a translation?

Yes/no

11. INSTITUTIONS HELPING IN DOCUMENT PROCUREMENT

11.1 Which is the national/regional organization that helps to get copies of documents or translations?

- a) INSDOC, Delhi b) INSDOC regional centre, Bangalore
- c) Indian Institute of Science, Bangalore
- d) Social Science Documentation Centre, New Delhi
- e) Any other (Please specify).....

12. Are you acquainted with the use of modern information technology in libraries. (eg. use of computer in cataloguing, circulation, serials control, information retrieval etc.)

Yes/no

12.1 If yes, give details.

13. USER EDUCATION

13.1 Do you think that there should be programmes conducted periodically to acquaint researchers with the methodology of literature search?

Yes/no

13.2 If yes, please give your specific suggestions.

- a) The library should conduct the programme as an annual feature for research scholars.**
- b) An outside agency like INSDOC/SSDC should organise them.**
- c) Any other agency (Please specify).....**

14. SUGGESTIONS

14.1 Do you have any suggestions to offer to develop a more satisfactory system than now available for meeting your total library requirements? If so give your suggestions briefly.

Place:

Signature

Date:

INTERVIEW SCHEDULES

SCHEDULE FOR RESEARCHERS

1. Background informations

1.1 Department..... 1.2 Name.....

1.3 Qualifications..... M.Sc./M.Phil/Ph.D.

1.4 Topic of research.....

1.5 Research experience: Yrs ... months.....

1.6 Educational qualifications of parents:

1.7 Annual income.....

2. Do you go to the university library Daily/occasionaly

2.1 Do you go to the departmental library? Daily/occasionally

3. No. of hours spent for research in each visit Hrs... mts....

4. Do you get assistance from the library staff? yes/no

4.1 If yes, what type of help do you get from the librarysstaff?

5. Have you experienced any difficulty in getting the required information from the catalogue? Yes/No

6. When you use a book do you consult its index? Yes/no

7. Are you aware of the fact that a journal generally publishes an index? (Subject/author/title) when a volume is completed?
Yes/no

8. If yes, do you consult the index when using journals?
Yes/no

9. Are you aware of the fact that some journals publish cumulative indices (ie. a combined index to a convenient range of volumes say 5 or 10 or 20 years/volumes) Yes/no

10. If yes, do you consult such indices for locating articles of interest to you in the journals concerned? Yes/no

11. How do you find out in which library the materials are available? Please specify....
By consulting a union catalogue/By other methods
12. What is your evaluation of various services. eg. translation services with the help of INSDOC/NASSDOC/IASLIC/bibliographic/documentation services by your library.
Not useful/useful/very useful
13. How would you like these services to be improved or modified?
14. Does your library have a computerised catalogue? Yes/no
15. If yes, have you experienced any difficulties in using it?
16. Does your library provide on-line information services?
Yes/no
17. Are you aware of the institutions providing information/documentation services at the national level? If so indicate them.
INSDOC/ NASSDOC/SENDOC/ NISSAT/ SECTORAL INFORMATION CENTRES/OTHERS (Please specify).....
18. Does your library organise any course for training its users in bibliographic (literature) search? Yes/no
19. Give your views of what your library should do to facilitate quick literature search and quick access to information.

Place,

Signature

Date:

SCHEDULE FOR LIBRARIANS

1. Departmental Library/University library(Please tick)
2. Collection (Books and Journals) Sufficient/ Insufficient
3. Daily working hours:
4. Open access / Closed access
5. Classification scheme: C.C/U.D.C/D.C. Any other:
6. Form of catalogue: Card/ book
7. Do you favour centralization/decentralization in the library
8. Do you feel need for computerisation in your library? Yes/No
9. Do you get chances to give user education in your library? Yes/No
10. Do you conduct courses in methodology of literature search periodically? Yes/No
11. Adequacy of reference tools(Please tick) Yes/Moderate/Inadequate
12. Any suggestions to improve the library services in your library.

Place:
Date:

Signature:
Name:
Library:

CASE STUDY SCHEDULE

1. Name:
2. Designation:
3. Department:
4. Topic of research:
5. Period of research/experience in research:
6. Do you know any foreign language? Yes/no
7. Have you gone abroad? Yes/no
8. Did you attend any training in methodology of literature search/user education/bibliographic instruction? Yes/no
9. If yes, is it abroad or in India? Abroad/India
10. Does your training help you to save your time in research work(in India) Yes/no
11. At what level did you attend any user education in India? P.G/M.Phil/Ph.D.
12. Do you think your prior training at any level help to save your time for research? Yes/no
13. Do you ever have any training in computer technology? Yes/no
14. Do you ever communicate with the experts in your field to save your time? Yes/no
15. Do you think a training in literature search will help to get an idea on all tools of information? Yes/no
16. How do you start your literature search? Please tick
Paper to paper/with the help of bibliographies/
catalogue/ or any other.....
17. How do you check the duplication of your research topic?

18. Do you make use of the library catalogue
for literature search? Yes/no
19. When do you do the maximum literaturesearch?
In the beginning/middle/end
20. Have you ever attended any national/
international seminars? Yes/no
21. If so, how many...national international
22. Have you ever presented papers in seminars? Yes/no
23. Do you have any published work? Yes/no
24. Are you a member of any national/
international association? Yes/no
25. Do you ever use Bibliography of doctoral
dissertations for your research work? Yes/no
26. Do you have any idea on NISSAT and its activities? Yes/no
27. Do you make use of Union catalogues for literature
search? Yes/no
28. Explain briefly how you did your search for literature
relevant to your research topic?
29. Any other suggestions?

(Signature)

Place:

Date:

R.