CHAPTER IV
Research Methodology

4.1 Research design:
A Research design is a plan of action to be carried out in connection with a research project. It is the conceptual structure within which research is conducted and it constitutes the blueprint for the collection, measurement and analysis of data. It is the specification of methods and procedures for acquiring the information needed for solving the problem. Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design.

4.2 Statement of the problem:
There is always a prestige in research; every profession puts its best brain to do it. Eminent philosopher of library science J. H. Shera said that “research is the key to the future of profession and is an important means by which institutional program is enriched” (Board of library and information science, 2005).

Presently researcher is working as a librarian in a college affiliated to the Swami Ramanand Teerth Marathwada University Nanded, as a part of his duty many research scholars consult him for their queries regarding their research work. During their conversations the researcher observed that they are facing several problems in information gathering. They also face problems in handling new tools and technology of information. So the researcher has decided to work in this area and to be aware with their problems and give them some suitable suggestions.

4.3 Research methodology:
Research methodology, (as the term suggests) comprised by two words i.e. ‘research’ and ‘methodology’. Method means the mode or rule if accomplishing an end. Methodology means a system of methods and rules applicable to research or work in a given science or art. It is connected basically with what principles and techniques to follow for collecting data, information and material for a given research. Methodology refers to more than a simple set of methods; rather, it refers to the rationale and the philosophical assumptions that underline a particular study. This is why scholarly literature often includes a section on the methodology of the researchers. This section does more than outline the researchers’ methods; it might
explain what the researchers’ ontological (study of being or existence) or epistemological (nature and scope of knowledge and belief views are).

There is several research methods have been introduced in the field of social science research. As there are many roads lending to a city likewise there are many methods are available to solve the research problems. The researcher has to choose one of appropriate method for his study.

As per the area and scope of the present study, researcher has prepared a list of respondents. After the preparation of the list it is observed that respondents of the study are spread several part of the nation. With the connection of wider area of study the researcher of present study selected ‘survey method’ for data collection.

4.3.1 Survey method:

Survey method is the method of gathering data from respondents through to be representative of some population, using an instrument composed of closed structure or open-ended items. Survey is also used as a quasi-experimental design for collecting data. This is perhaps, the dominant form of data collection in the social science, providing for efficient collection of data over broad populations, amenable to administration in person, by telephone and over the internet. Some forms of survey research by telephone or the internet may be completely automated. Data collection in surveys is either through questionnaire method or interview or schedule method (Banarji & Roy, 2008).

4.3.2 Advantages of survey method:

1. Survey can be useful when a researcher wants to collect data on phenomena that cannot be directly observed,
2. Since population can be quite large, researchers directly question only to the sample of the population (Banarji & Roy, 2008).

4.4 Objectives of the study:

Research is a systematic study done with the establishment of a set of objectives. These objectives control the study as well as help to prevent from scribble of settled direction of the study. Objectives are to be set according to the hypothesis and collection of data should have to fulfill them as well. Objectives state the primary purpose of the research that has been undertaken, they also states what will/ will not be addressed to. Research objectives are written as statement beginning with action verb describe, determine, find out identify. The SMAAC
model of objective setting, as proposed by Peter Kal mund (2003) explains the essentials in formulating a research objective.

S – Specific – objectives have to be clearly and specifically stated. They must show that what to be achieved through the research study. They should have easy to understand as to what is intended

M -- Measurable – objectives have to ensure that the objectives can measure what has been intended through the research study. Can the stated objectives measure what they claim?

A – Achievable – objective must have realistic as well as achievable. Can they actually achieve what it was originally intended? How will they be achieved?

A – (This may not applicable to every study) Accountable – who is ensure that the objective is put in to action and what specifically is being put into action?

C -- Compatible – is the objectives in the line with the purpose and focus of the research study? Has an integrated research model been achieved throughout the study?

4.4.1 Objectives:

The allied objectives of the study were as following:

1. To identify the research scholars with their frequency of library visit.
2. To identify the research scholars with the time spent in the library.
3. To identify the users with the purposes of seeking information.
4. To identify the information needs of the users.
5. To identify the research scholars by their usage of formal information sources.
6. To identify the research scholars by their usage of e-resources.
7. To investigate the information seeking behaviors of research scholars.
8. To identify the channels of information used by the research scholars
9. To know the awareness level of library tools and techniques used by Researchers.
10. To study the researchers' opinion regarding the impact of electronic dissemination of Information on their information gathering habit.
11. To find out the research scholars’ preference to obtain journal articles and reference material for their academic and research need.
12. To study the use behavior pattern and methods/mode of accessing of searching information
13. To find out the satisfaction level with regard to quality of e-resources available from the research scholars.
14. To examine & understand the common problem faced by the research scholars to access the information resources.
15. To analyze the possible reasons for not using information sources, if any; and to suggest measures for enhancing the use of information sources.

**4.5 Scope and limitations of the study:**

The study was confined to the research scholars registered in various study centers within the Swami Ramanand Teerth Marathwada University Nanded. There are twenty two research centers involved in the research activities of the university. Various Schools in the university campus are also working as a research center and other centers are as follows;
1. Swami Dayanand education society’s arts college Latur;
2. Swami Dayanand education society’s commerce college Latur;
3. Swami Dayanand education society’s science college Latur;
4. Swami Dayanand Education Society’s Law College Latur;
5. Rajarshi Shahu Mahavidyalaya Latur;
6. Mahatma Basweshwar mahavidyalaya Latur;
7. Mahatma Gandhi mahavidyalaya ahmedpur;
8. Hawagi Swami Mahavidyalaya Udgir;
9. Shivaji Mahavidyalaya Udgir
10. Maharashtra Udaygiri Mahavidyalaya Udgir
11. Nanded Education Society’s Science College Nanded
12. Yashavant Mahavidyalaya Nanded;
13. Nanded Education Society’s people’s college Nanded;
14. Prabtibha Niketan mahavidyalaya Nanded;
15. Netaji Subhashchandr Bose college Nanded;
16. Mahatma Gandhi Mission’s College of Engineering;
17. Shree Guru Govind singh Engineering College Nanded;
18. Shree Shivaji Mahavidyalaya Kandhar;
19. Degloor College Degloor;
20. Dnyanopasak Shikshan Prasarak Mandal’s Arts, Comm., Science College Parbhani;
21. Shivaji Arts, Commerce and Science College Parbhani;
22. Adarsh Education Society’s Arts Comm. Science College Hingoli.

Research programmes in Social Sciences, Humanities, Education, Science and Technology has run in these centers. The study was to be restricted to the students registered for the Ph.D. scholars up to 31st March 2011 and students registered for M. Phil in the educational year 2012-13. As per the university record there were 769 students registered in various research centers and M. Phil in the period mentioned. So the study was delimited with these scholars and they were the population of this survey. Reliability of the facts depends upon the honesty of the respondents.

4.6 Significance of the study:

Swami Ramanand Teerth Marathwada University Nanded is situated in the central south Maharashtra. This area is a part of Aurangabad administrative region. There are four districts come under the jurisdiction of the university. This area is mostly known as the educationally and financially backward. Due to lack of Special libraries, Information centers/ systems, well equipped labs, the circumstances within the university jurisdiction are become contradictory for undergoing research activities.

Through this survey the researcher attempts to study the difficulties researcher comfort with, he also tried to assess the standings of researchers in seeking. This study will suggest the various ways of procuring the flow of update information to speed up the research activities in the jurisdiction of Swami Ramanand Teerth Marathwada University Nanded.

4.7 Hypothesis of the study:

A hypothesis is a particular kind of conjecture that clearly formulates a suggestion about the solution to certain problem. the term ‘hypothesis’ has been derived from the old Greek word ‘hypotithenai’. It means ‘to put under’ or ‘to suppose’ (Banarji & Roy, 2008). A hypothesis is an educated guess about the phenomenon being studied. ‘Educated’ means that goes beyond mere speculation. That is, the hypothesis is a translation of information gathered from theories, other research and causal observation.

According to Pearsall and Trumble, a hypothesis is, “supposition made as a starting point for further investigation from known facts” (Encyclopedic Dictionary of Information Technology, 2003). As per the above mentioned definition it can be said that hypothesis is a primary knowledge which may an assumption and it neither be produce with the confidence nor prove.

Following figure can illustrate the process of hypothesis generation;
Fig. 4.1 Generation of a research hypothesis


Allied hypothesis were formulated this study.

1. Researchers of Swami Ramanand Teerth Marathwada University frequently visit the libraries and spent lot of time in the library to seek, screen filter and gather information.
2. They need information for research and other purposes and they seek it through different sources from time to time.
3. Researchers use formal, informal information sources as well as e-resources to fulfill their information needs.
4. Researchers in the said university utilize several information channels.
5. They are much aware about library tools, techniques and services. They use it in information collection frequently.
6. Researchers feel impact of ICT upon the information collection activities.
7. They obtain information through journal articles and reference material to fulfill their academic and research need.
8. They are satisfied with the quality of e-resources.
9. Certainly they face some problem to access the information resources.
4.8 Research methodology:

In the field of survey research a question arises, from whom the data will be collect? Is it from a selected group of the respondents or every respondent of the population? These two alternatives fix the ‘data collection technique’. Research methodology experts suggested two types of data collection techniques;

1. **Census method:** A single unit or member of ‘population’ is referred to as a population element. A ‘census’ refers to a count or a study of the entire element in the population. As was noted earlier, it is generally more economical in time, effort and money to get the desired information for only some of the elements than for all them, i.e., the ‘population’ (Kothari, 2007).

2. **Sampling method:** When field studies are undertaken in practical life, consideration of time and cost almost invariably lead to a selection of respondents i.e., selection of only a few items. The respondent selected should be as representative of the total population as possible in order to produce a miniature cross-section. The selected respondent constitute what is technically called a ‘sample’ and the selection process is called ‘sampling technique’. The survey so conducted is known as ‘sample survey (Kothari, 2007).’

Population of the study is not so large in numbers researcher can approach and cover all the population. So he selected census technique for the data collection.

4.8.1 Tools of data collection:

Data collection is a very important task which begins next to a research problem has been defined and research design chalked out. Researcher has to keep in his mind that there are two types of data; primary and secondary. Which type of data he needs, location of the respondents their educational status these factors will affect the selection of tool for data collection. Researcher is free to select one tool or more as per the demand of the study.

In the survey method of research basically researcher gathers data from the primary resources. Secondary resources help in the collection of supporting data. In the primary resources there are two types;
1. **Primary resources:**
   A. **Paper resources:** It includes letters, contracts, census reports, diaries, manuscripts, court records etc; other hand
   B. **People resources:** The task of data collection from the people has been done through various techniques likewise, interview; questionnaire; observation; schedules etc.

2. **Secondary resources:**
   In the secondary data textbooks, encyclopedias, dictionaries, hand books, yearbooks, journals etc. are to be included.

   Library collection occupies the major part of paper resources. Most of the social science researchers prefer these resources. But some studies cannot be done only with the help of paper resources especially field studies. Some of the data hadn’t record anywhere because it is concern to the experiences, emotions and feelings as well as routine activities of the people. It can be collect only through the discussion with them or to observe their activities. If the population of the study is limited in the number and the study site spreads on limited area. Observation, personal interviews, schedules can be apply. But many times it doesn’t happen, at that time filling up the structured questionnaire by the respondents can be the best option for data collection.

   Respondents of the present study were the ‘research scholars’ registered in the various research centers affiliated to the Swami Ramanand Teerth Marathwada University Nanded. Geographically they are spread in the large area so it is neither possible to interview nor observe every respondent. With the consideration of present situation ‘questionnaire’ was the suitable tool for data collection in the study.

   **4.8.2 Construction of questionnaire for research scholars:**

   A crucial part of good research design concerns making sure that the questionnaire design addresses the needs of the research. In other word it can be said that researcher should ensure that the questions asked are the right ones. According to Osgood and others (1957), following three steps should be taken in the consideration at the time of questionnaire construction.

   i. Question ascertainment stage:- determine the question to be asked;
   ii. Question type selection stage:- select the question type for each question and specify the wording;
   iii. Designing stage:- design the question sequence and overall questionnaire layout.
For the data collection about the “information need and information seeking behaviour of researcher scholars of Ramanand Teerth Marathwada University Nanded investigator used questionnaire as a tool of data collection. Banerjee and Roy (2008) suggested two types of questions which may include in a well prepared questionnaire, i. Open-ended questions, and ii. Close-ended questions.

In the open ended questions respondent get freedom to answer the questions in written form, researcher, who is asking questions leave some space for the answer. In close-ended type questions researcher gives some alternatives to choose. Sometime respondents can choose one from given alternatives and sometime he can choose more. As per the demand of the study and objectives settled, both types were used by the researcher.

4.8.3 Description of the questionnaire used:

For the primary data and required information collection a standard structured questionnaire was designed, where five point Likert type scale was used. Questionnaire was divided into two parts section ‘A’ and section ‘B’. In A section personal information was asked like name, professional status, gender, qualification, mailing address etc. B section questions were divided in several sub sections. These sub sections were arranged according to the objectives of the study. Every section has its own features i.e. first sub section, consists of about the library visit of research scholars of the said university. Sub sections were arranged in the questionnaire are as follows;

i. General information;

ii. Library visit;

iii. Information needs;

iv. Information seeking behaviour;

v. Library tools, techniques and services

vi. Impact of ‘ICT’ on users’ information seeking behaviour;

vii. Use of Informational Resources by the Users

viii. Problems faced by the research scholars during the information seeking;

ix. Satisfaction level;

x. Suggestions of the research scholars.
4.8.4 **Likert method:**

Likert-type scales are developed by utilizing the item analysis approach wherein a particular item is evaluated on the basis of how well it discriminates between those persons whose total score is high and those whose score is low. Those items or statements that best meet this sort of discrimination test are included in the final instrument.

Thus Likert-type scales consist of number of statements which express either favorable or unfavorable attitude towards the given object to which the respondents is asked to react. The respondent indicates his agreement and disagreement with each statement in the instrument. Each response is given numerical score, indicating its favorableness or unfavorableness, and the score are total to measure the respondents’ attitude. In other words, the overall scores represents the respondents position on the continuum of favorable- unfavorableness towards an issue. In a Likert scale, the respondent is asked to respond to each of the statements in terms of several degrees. In the present study, the researcher used five-point scale for degrees of agreement and disagreement i.e. i) Strongly Disagree ii) Disagree iii) Not Sure iv) Agree v) Strongly Agree

4.8.5 **Persuasion for the responses:**

After the compilation of questionnaire researcher has prepared a list of research scholars with their respective address, mail Id, cell no. etc. as much as possible. Xerox copies of questionnaire has brought in sufficient no. and sent it to every respondent via registered post. Stamped envelope was attached with every questionnaire. Some questionnaires were sent through the E-mail to the respondents who provided their mail Ids. Researcher reminded the respondents, who didn’t respond within a month through the e-mail, cell phone etc.

4.8.6 **Sources of data:**

The primary data of present study was collected from the research scholars registered in the various study centers of the Swami Ramanand Teerth University Nanded. For the primary data collection researcher has prepared a structured questionnaire according to the formulated hypothesis and set of objectives of the study. Supporting data i.e. secondary data was collected from sources like textbooks, dictionaries encyclopaedias, research journals and online resources etc.
4.8.7 Data analysis:
The data collected through the questionnaire was analysed with the help of the computer. The development of electronic devices, specially the computers, has given added impetus to this activity. Computer is certainly one of the most versatile and ingenious development of the modern technological age. After the questionnaire design finalized, a coding frame have been developed using Microsoft Excel for each variable. Before analysis, returned questionnaires have been sight-edit for missing data. Quantitative data have been analyzed using descriptive statistics from the statistical package for social sciences (SPSS). Three sets of frequencies have been analysed.

i. Frequency of response to individual questions
ii. Frequency of multiple responses
iii. Frequency of responses from individual disciplines
iv. Results have been presented using figures and tables generated by the excel software. The responses to the open questions have been transcribed using Microsoft word. They have been then arranged according to discipline and have been grouped according to occurrence of words or ideas.

4.8.8 Statistics used for analysis of data:
The statistical analysis of the data for the present study was done by applying
1) Simple percentage and 2) Chi-square Test

4.8.8.1 Chi-square test:
The Chi-square test is one of the useful test amongst the several tests of significance developed by several statisticians. The basic purpose to use Chi-square test was to compare an observed group of frequencies with an expected group of frequencies. This led to deduce the expected frequencies from the null hypothesis. The level of significance was set at 0.05. The statistical analysis of the data of the present study was done by statistical package. (Best & Kahn, 2002).

Chi-square, symbolically written as $X^2$ is a statistical measure used in the context of sampling analysis for comparing a variance to a theoretical variance.

4.8.8.2 Steps involved in applying chi-square ($X^2$) test:

i) First of all calculated the expected frequencies on the basis of given hypothesis or on the basis of null hypothesis. Usually in case of 2 x 2 or any contingency table, the expected frequency for any given cell is worked out as under:
ii) Obtained the difference between observed and expected frequencies and found out the squares of such differences i.e. calculated \((F_o - F_e)^2\)

iii) Divided the quantity \((F_o - F_e)^2\) obtained as stated above by the corresponding expected frequency to get \((F_o - F_e)^2 / F_e\) and this was done for all the cells frequencies or the group frequencies.

iv) Found the summation of \((F_o - F_e)^2 / F_e\) values or what we call.

This is the required \(X^2\) Value

\[
X^2 = \sum \frac{(F_o - F_e)^2}{F_e}
\]

\(F_o = \) Observed frequency
\(F_e = \) Expected frequency-
\(df = (r-1) \times (c-1) \quad \text{or} \quad df = (r-1)\)
\(df = \) Degree of freedom.
\('r' = \) number of rows
\('c' = \) number of columns

It is an important part of any scientific study to process the data and analyze in accordance with the method laid down for the purpose in order to arrive at the possible results. For the completion of present study data was collected through the questionnaire and was analyzed by the following steps.

1. After analysis, data was framed in the tabulation form.
2. Calculated percentages.
3. Chi-square test was used to compare an observed group of frequencies with an expected group of frequencies. This led to deduce the expected frequencies from the null hypothesis.
4. The analysed data was used for the conclusion of the present study.

4.9 Outline of the thesis chapters:

The thesis consist of six chapters including Introduction, Review of Literature, information need and Information Seeking Behaviour, Research Methodology, Descriptive Analysis and Interpretation of data, Summary, Findings & Conclusion followed by Bibliography.
4.9.1 Chapter I- Introduction:

The first Chapter deals with the Introduction begin with the term Research, its nature definitions, importance, benefits and objectives of the research. The term information was also discussed in this chapter. Various forms of information i.e. data, information, knowledge were discussed. Characteristics of information, qualities of information its types have discussed. Use of information in research and development, industries, business etc. has explained. Role of a librarian in research process has added in the chapter too. Users their types, academic research, academic research in India and at the SRTM University Nanded at a glance has included in the chapter.

4.9.2 Chapter II- Review of literature:

In Chapter two, there is a review of existing literature which helps to clarify the nature of the problem, while highlighting gaps. It explains how the present research brings out to open the gaps or problems through an examination of literature by other researchers. Put differently, “the author must establish that existing perspectives are inadequate, and persuade the reader that the new vision is relevant and adds greater insight to the phenomena than was possible previously” (Parry, 1998). It was devoted to Review of related studies. The reviews were arranged chronologically as well as profession-wise regarding to the information needs and information seeking behaviour.

4.9.3 Chapter III- information needs and information seeking behaviour:

The Third Chapter deals with the information needs and information seeking behaviour. In this chapter tried to describe the term need, information needs, its various facets, types etc. next part of the chapter deals with the term information behaviour, seeking behaviour, its worldwide history as well. Models of information seeking behaviour and its usefulness also discussed at the end of this chapter.

4.9.4 Chapter IV- Research methodology:

Prepared research methodology including research method and questionnaire technique for data collection. Objectives and related hypotheses were formulated. Proposed research gives the importance and usefulness of the study.

4.9.5 Chapter V- Descriptive analysis and interpretation of data:

Fifth chapter consist of presentation of the results, an analysis and synthesis of the findings regarding to the information needs and information seeking behaviour. This chapter deals with the descriptive analysis and interpretation of data related to general information, views of the research scholars regarding the library collection,
services, impact of the IT on library as well as library services. Researcher also tried to be aware with the problems faced by the research scholars of the university.

4.9.6 Chapter VI- Summary, findings and conclusion:

Sixth chapter provides the presentation of the summary, findings, conclusions and suggestions arising from the research, as well as highlighting implications for further research followed by the bibliography and Appendices.

4.10 Referencing Style used in the thesis:

In doing research, the acknowledgement of scholarly works and ideas by other people is achieved by referencing and citing. At the beginning of the research, it is important “to find out which referencing style or citation format is used by or acceptable. The Harvard citation style, the Publication Manual of the American Psychological Association, and the MLA style handbook are widely used” (Wilkinson 2000). The significance of this is the fact that “in a doctoral thesis, appropriate citation and critique signals the espousal of the appropriate values, etiquette, style and cultural savvy” (Parry, 1998).

The American Psychological Association (6th Edition) reference style uses the Author-Date format. In the field of research, many authors are more familiar with the author and date system. Hence the APA citation style has been used to cite the authors work.