Chapter-4: Methodology

4.1 Introduction

Research Methodology is defined as the design of procedures and methods by means of which the identified problem will be studied. It is concerned with population under investigation; how sample will be drawn from population and how large should be the sample; where and when will the study be conducted; what are the operational definitions of variables relevant to the research problem and how will the needed research data be collected and analyzed (Busha & Harter, 1980). Research Methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it the researcher studies the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them. It is necessary for researcher to know not only the research methods or techniques but also the methodology (Kothari, 2004).

Methodology has its own implications and necessity in scientific and systematic way of investigation, because objectively any research investigation cannot be obtained until it is carried out in a very planned and systematic manner. Scientific investigation involves careful and proper design, use of standardized tools and tests, identifying adequate sample by using sampling techniques, qualitative procedures for collecting data and then careful tabulation of data and use of appropriate statistical techniques for analyzing the data.

4.2 Different types of Research Methodologies

Though there are number of research methodologies, however the noteworthy methodologies among them are discussed here under:

4.2.1 Experimental Method

Experimental research differs from other research approaches through is greater control over objects of its study. The researcher strives to isolate and control every relevant condition which determines the events investigated, so as to observe the effects when the conditions are manipulated. Chemical experiments
in the laboratory are the purest form of this type of research (William Nicholas, 2005).

4.2.2 Scientific Method
Dewey defines Scientific Method as an ‘active, persistent and careful consideration of any belief or supposed form of knowledge in the light of grounds that support it and the further conclusions to which they end’ (Kumar, 1992).

4.2.3 Survey Method
Tull and Albaum define survey research as ‘a systematic gathering of information, from a sample of respondents for the purpose of understanding and/or predicting some aspect of behavior of population of interest’. Here, researcher is concerned with the art and science of asking questions and/or observing behavior to obtain information (Kumar, 1992).

4.2.4 Case Study Method
Case Study has been defined by Steuart as the examination of a single situation, person, groups or institutions as complex wholes in order to identify types and procedures (Cauvery et al., 2003).

4.2.5 Historical Method
Historical research has been defined by Burg as the systematic and objective location, evaluation and synthesis of evidence in order to establish facts and draw conclusion about past events.

4.2.6 Descriptive Method
Instead of examining records, descriptive research relies on observation as a means of collecting data. It attempts to examine situations in order to establish what is the norm, i.e. what can be predicted to happen again under the same circumstances (William Nicholas, 2005).

4.3 Questionnaire design
Despite being the most popular research technique, questionnaires produce infamously low response rate unless the researcher administers them personally. Questionnaire design involves great deal of common sense and
personal experience (Pickard, 2007). The investigator has designed a set of two questionnaires for the present thesis, one for the users of IIT Delhi, IIT Kanpur and Kashmir University and the other for library staff of Central Library, IIT Delhi; P. K. Kelkar Library, IIT Kanpur and Allama Iqbal Library, Kashmir University. Out of the two questionnaires, the one designed for the users is based on structured pattern and is in definite order and format. The aspects covered in this questionnaire are: awareness of users about automated libraries; awareness about library softwares; about OPAC (Online Public Access Catalogue) and its search facilities; user satisfaction with staff and overall retrieval system. Similarly, the questionnaire designed for library staff also consists of number of questions in definite order and format. However, this questionnaire is divided in two parts viz general and specific questions. This questionnaire also covers various aspects like library automation; library software packages; networking; different modules of the softwares and Integrated Library System (ILS). In present doctoral thesis, Census method was adopted for data collection in case of library staff whereas in case of users, under Stratified random sampling, random sampling was adopted for the purpose of data collection. The questionnaire administered among library staff is given in Appendix-I, while as the one administered among users is given in Appendix –II.

Besides the distribution of questionnaires among both the staff and users of the select libraries, the investigator also visited the websites of all the three surveyed libraries and personally observed the status of library automation, OPAC and other search and retrieval facilities.

4.3.1 Pilot survey

Before starting the main process of data collection, the Investigator conducted a pilot study. The pilot study indicates the embarrassing areas of enquiry. It throws up important clues in regard to the wording of questions, and may also suggest addition or elimination of certain indicators and variables. Discovery of probably responses and relevant dimensions of questions through pilot study
can thus lead to formulation of more meaningful questions (Sharma & Jain, 2008).

4.4 Population and selection of Sample

A ‘Sample’ as the name implies, is a smaller representation of a larger whole. The observation of some phenomena in complete detail would involve such a mess of data that analysis would be slow and tedious. Moreover, to analyze large quantities of material is wasteful when a smaller amount would suffice (Goode and Hatt, 2006). All items under consideration in any field of enquiry constitute a ‘Universe’ or ‘Population’. A complete enumeration of all items in population is called as Census enquiry. It can be presumed that in such enquiry, when all items are covered, no element of chance is left and highest accuracy is obtained. But, in practice this may not be true. Even the slightest element of bias in such an enquiry will get larger and larger as the number of observation increases (Kothari, 2004). The present study was conducted among the staff and users of two premier institutes of national importance and one of the State Universities of India. Here, Census method is adopted for the staff because the population in all the select libraries is very small.

Against this backdrop, samples were selected by using stratified sampling method (having Students, Research Scholars and Faculty Members). Stratified random sampling method is a combination of random sampling and purposive sampling. Under this system the universe is first divided into number of strata or groups based on single criterion. Then from each group member of items are selected randomly. Under stratified random sampling, random sampling was adopted. Random sampling is the most popular method and random does not mean haphazard selection of units from a universe, it refers to all units in the population getting equal chances of being selected (Cauvery et al., 2003). The researcher selected a sample of 527, 315 and 555 out of total population of 5269, 3143 and 5550 users respectively in all the three select libraries for this study. Thus, 10% of total population was taken as a sample. This sample was randomly selected. The investigator visited personally Central Library of IIT Delhi, P. K. Kelkar Library of IIT Kanpur and Allama Iqbal
Library of Kashmir University and approached the librarians of respective libraries for seeking permission to collect the necessary data.

4.5 Methodology Adopted

Since, the present doctoral thesis is concerned with the usage of library software by Students, Researchers and Faculty members of IIT Delhi, IIT Kanpur and Kashmir University; hence Survey method was adopted for the present work. Though there are number of techniques available for data collection, however, worth mentioning among them are questionnaire; scheduled; interview, observation, etc. There are three commonly used techniques for gathering the data in survey research; the Questionnaire method, the Interview method and the Observational method. Notably, the investigator has used questionnaire for collecting the data for present study. However, this has been supplemented with the interview as and when required.

The data for survey research is usually obtained by means of questionnaire, a series of pre-determined questions that can be either self-determined, or administered by mail, or asked interviews. Since, questionnaires are considered the single most popular data collection tools in any research involving human subjects (Pickard, 2007). Therefore, questionnaire is key important tool used for present work to collect necessary data. The investigator has designed a set of two questionnaires, one for the Library staff and another for the users of the select libraries. The investigator personally visited all the three select libraries and has approached to the librarians and users of IIT Delhi, IIT Kanpur and Kashmir University to collect the necessary data. Significantly, a pilot study has been undertaken to check the validity and objectivity of the prepared questionnaires. Subsequently, questionnaires were administered for data collection. The two questionnaires, one for the staff and other for the users were pre-tested before finalizing them. The main purpose of pre-testing was to find out the users opinion, the language used and to rule out any ambiguities, doubts and pitfalls so as to get the target responses and results. The questionnaire for users was distributed among twenty users of select libraries. The respondents were asked to note down the difficulties while
filling-up the questionnaire. During the whole exercise, several suggestions were put forth both from the respondents and from the librarians. Against these suggestions, necessary modifications have been carried out after the pilot study to design the final questionnaires.

4.6 Administration of Questionnaires to Users

The investigator has approached directly to users and handed over questionnaires to them. Significantly, care has been taken to have a representative sample of total population of students, though the random sampling was adopted. A total of 527 questionnaires were administered for a population of 5269 users comprising 3900 UG students and PG students 948 Research Scholars and 421 Faculty members in the month of April 2010 among the users of Central Library, IIT Delhi. Similarly, 315 questionnaires were administered for a population of 3143 users comprising 2028 UG students and PG students and 758 Research Scholars and 357 Faculty members of P. K. Kelkar Library, IIT Kanpur in the month of June, 2010. Though there are 6000 students registered with Kashmir University, however, some about 850 students are pursuing their courses from different colleges which are affiliated with Kashmir University. Therefore, a total of 555 questionnaires were administered in the month of August, 2010 for a population of 5550 users comprising 4750 PG students, 400 Research Scholars and 400 faculty members of Kashmir University.

The ultimate response rate from the library users of IIT Delhi, IIT Kanpur and Kashmir University are found to be 89.75%, 92.38% and 90.63% respectively. The response rate of users is shown in the table given in next chapter.

4.7 Administration of Questionnaire to Staff

In case of staff, the researcher has approached directly to the staff after getting the permission from the librarians and handed over questionnaire to them. Significantly, care has been taken to collect the information from whole staff of the population, though Census Method was adopted. In this method, all units of the population are selected to test one or more characteristics of all those units.
The units are often an actual national population, or it can be national literacy rate or number of books in a particular library, etc. This type of study is often conducted by Government agencies. The investigator has personally handed over the questionnaire to librarians of respective libraries. Apart from this, the same set of questionnaire has also been handed over to the In-Charges of different sections of these libraries. These In-Charges have provided information pertaining to their sections and subsequently all the filled-in questionnaires have been submitted to the librarian of the institute. Notably, the librarians cross checked all the information concerning different sections and merged them in one set of questionnaire. The investigator was given back this filled-in questionnaire having consolidated information of all the sections.

4.8 Interview Method

It is an important element on the part of research methodology to explain the steps which are being taken to help the respondents to make them feel at ease, and to enable them to feel some degree of control over data collection process (Oliver, 2008). Interview is the face-to-face conversation between the researcher or his agent (who hopefully knows what he wants from the respondent) and the respondent who has the desired information in his mind or possession. As questionnaire method has certain limitations to collect the data. Therefore, to enrich the qualitative data from the questionnaires, the investigator adopted the structured interview method for data collection. Structured interviews are those in which questions are posed in a face-to-face situation and the respondent is offered a complete list or some of the potential answers. Questions to be asked are formulated before the interview. Apart from above, the investigator felt that for filling the gaps in information provided by the respondents, scheduled method would be most appropriate. Therefore, scheduled method was also adopted for the purpose. Schedule method is a technique of collecting data by sending schedules through an enumerator. The enumerator contacts the respondent, gets the replies to the questions from him, but fills up the schedule in his own handwriting (Kumar, 1992). The investigator has used all the three methods for present work. Apart from these
methods, the investigator also consulted various printed and electronic resources such as annual reports; pamphlets; brochures; newsletters; websites and other records to cross-check the validity and authenticity of the data provided by the respondents.

4.9 **Problems in data collection and their solutions**

Despite their busy schedule and work pressure, the Librarians of IIT Delhi, IIT Kanpur and Kashmir University helped a lot during the whole exercise of data collection. In fact, they arranged a separate meeting for this purpose and showed a lot of interest in providing valuable suggestions regarding the present doctoral thesis. However, while collecting the data for this study, the librarians of all the select institutes had devoted sufficient time for filling up the questionnaire. When the investigator visited the Central Library of IIT Delhi in the first visit, the librarian could not provide required data instantly due to his busy schedule. Similarly, the librarian of IIT Kanpur and Kashmir University also could not fill up the questionnaires at the first visit, due to their work pressure. However, when the investigator again approached the head of Central Library, IIT Delhi after a couple of months, he was kind enough to provide all the useful data. In case of IIT Kanpur, the librarian assured to send the filled-in questionnaires within short span of time. Unfortunately it took couple of months to reach the post at Aligarh. In Kashmir University, the librarian provided some useful suggestions and asked to leave the questionnaire and the filled-in questionnaire had been returned to the investigator after a week.

It is noteworthy to point out here that investigator had also used several data collection techniques such as interview, observation and document review to check the validity and reliability of collected data.

4.10 **Standard Followed**

American Psychological Association (APA, 2010) format has been followed for providing bibliographical references. The two examples of this format are mentioned hereunder:

4.11 Analysis and Interpretation of Data

The data collected from IIT Delhi, IIT Kanpur and Kashmir University through questionnaires was scrutinized by comparing answers to one question with answers to related questions so as to check the consistency and compatibility. The investigator used a self designed coding sheet and statistical counting was done for each response. The data obtained through questionnaires has been cross checked by the data obtained through interview and observation. Finally, the data have been organized; analyzed; compared; consolidated; tabulated and interpreted by using tables, percentages and statistical techniques. The software package MS-Excel and Chi-Square statistical tests have been used to verify the validity of results. In the light of above data, useful findings, recommendations and conclusion have been derived.
References


