CHAPTER-IV

METHODOLOGY
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4.1 Introduction

This chapter deals with methods and tools used for data collection, analysis, scoring and tabulation for the present study. Further it deals with selection of sample on the problem “Effectiveness of Library and Information Services to the Researchers of Visvesvaraya Technological University: A Study”. The investigation began with a detailed literature search. The primary sources used for literature search were Library and Information Science Abstract (LISA) and Library and Information Science and Technology Abstract (LISTA). Further the investigator also searched Google, Google Scholar, Science Direct and Emerald database for finding relevant research work. Important primary sources such as journals, reports and conference proceedings were also consulted to study the recent developments in the field with variety of issues related to the topic of research.

4.2 Nature of Study

4.2.1 Data collection Tools

Two instruments used in the form of structured questionnaires for collection of data. They are:

a. Questionnaire for researchers
b. Questionnaire for Librarians

The sets of questionnaires were developed on the basis of detailed study of earlier research studies on the topic. This helped the researcher in designing questionnaire and to identify criteria to be used to evaluate effectiveness of library resources and services in research center libraries. Based on these studies investigator developed a questionnaire with more than 100 questions. In discussion with the subject experts and statisticians the number of questions were reduced.

4.2.1.1 Questionnaire for Librarians

The investigator adopted survey method to collect data from researchers and librarians from 92 research centers by using a structured questionnaire. The questionnaire for the librarians was first designed and the same were distributed to the librarians of research centers. This was to examine the actual performance of each of
the 92 libraries by asking librarians to rate their library’s performance against each of the indicators on a Likert scale of 1-5 (Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree) when asked to judge the effectiveness of their respective research center library. The responses received were analyzed by using statistical methods.

4.2.1.2 Questionnaire for Researchers

One more questionnaire was designed and administered to the researchers. Random sampling method was followed to distribute questionnaires and obtain data from researchers. Likert method of scale construction is adopted to know effectiveness of resources, facilities and services in their respective research centers. The format of a typical five level Likert item is Very Effective, Effective, Somewhat Effective, Ineffective and Very Ineffective.

4.2.1.3 Instrumentation

The survey questions fell under two categories:

a. Preference for or usefulness of indicators.

b. Performance of the library on those indicators

4.3 Compiling the List of Candidate Indicators

An exhaustive list of indicators with respect to library effectiveness was drawn from the literature of library and information studies (including research literature and professional literature) and from initial field interviews. Searches were performed on the LISTA and LISA database using descriptors related to libraries effectiveness, evaluation, measurement, performance and efficiency. The principal investigator added items from their own experience.

4.4 Sample size

The study covered librarians of research center libraries under VTU in Karnataka. Among the total samples of 92 librarians, 82 librarians (88.13%) responded to the survey. On the other hand the questionnaires were circulated among 1600 research scholars out of whom 1072 responses were received representing 67 percent. The researchers belonging to 30 subjects under the cluster of 8 broader
disciplines: Civil Engineering, Mechanical Engineering, Electrical and Electronics Engineering, Electronics and Communication Engineering, Computer Science and Engineering, MBA, applied technology and Basic Sciences were covered.

a. **Enlisting cooperation of the libraries:** The study objective was to gain the initial co-operation of 92 research centers libraries. A letter was sent to all 92 librarians describing purpose and method of the study and enlisting their participation. Within 20 to 30 days each librarian was called by investigator to know their response. Due to the high rate of response from all librarians were not called. Among 92 research centers only 82 (89.13%) agreed to respond.

b. Also letters were sent to researchers at 92 research centers describing the purpose of the study. For around five months each researcher was called by investigator to secure his/her response. Due to the high rate of response not all researchers who received letters were called. Among 1600 researchers, 1072 (67%) agreed to respond.

c. **Survey Response:** Questionnaires with covering letter for the librarians and researchers were sent to them. The 92 librarians who were then asked to distribute those questionnaires to researchers.

The following table shows the number of questionnaires sent and received back from each category of respondents.

<table>
<thead>
<tr>
<th>Table 4.1</th>
<th>Constituent Sample and Response</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Number Sent</td>
</tr>
<tr>
<td>Librarians</td>
<td>92</td>
</tr>
<tr>
<td>Research Scholars</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>1692</td>
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</tbody>
</table>
The investigator conclude that the extraordinary rate of return was due to a number of following factors:

a. Librarians were contacted by telephone and mailed by the investigator.

b. Respondents were mostly cooperative.

c. The topic of effectiveness seems to be salient to the research scholar’s community.

4.5 Data Collection

After receiving the questionnaires from various research center libraries which come under VTU, they were analyzed in the light of the objectives stated. After data collection the data entries were done in excel and were transferred to SPSS statistical software to derive necessary values. To test the research hypothesis, Chi-Square and Spearman correlation test were used.

4.6 Time Period

The investigator did the primary field survey during March 2012 to August 2012 by visiting 92 VTU research centers, regarding the nature of the problems with the different scaling methodologies related variables. The survey was done on the basis of gathering mass data to indicate the present trend of Effectiveness of Library and Information Services.

4.7 Problems Encountered in Data Collection

i. The researcher had a hectic schedule of visiting 92 research centers in all over Karnataka.

ii. The researcher visited 2 to 3 times to research centers to get the collected data from Librarians and researchers.

iii. The researcher found it difficult to persuade the concerned authorities of the research centers, ensuring that the filled in questionnaire would be kept confidentially.

iv. Few researchers felt the questionnaires were too elaborate to fill-in as they were said as busy in their research work. However data was collected by constant persuasion.
4.8. Likert Scale

Likert scale is used to assess students' confidence score on their knowledge. This way of assessing and scoring is a simple task. For instance, students may score high or low confidence for a specific test question. Where high confidence response to questions includes distracters to similarly where students' confidence level is low we need to think on the questions asked.

4.8.1 Sample Question Presented Using a Five-Point Likert Item

An important distinction must be made between a Likert scale and a Likert item. The Likert scale is the sum of responses on several Likert items. Because Likert items are often accompanied by a visual analog scale, the items are sometimes called scales themselves. This is the source of much confusion; it is better, therefore, to reserve the term Likert scale to apply to the summed scale, and Likert item to refer to an individual item.

A Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria; generally the level of agreement or disagreement is measured. It is considered symmetric or "balanced" because there are equal amounts of positive and negative positions. Often five ordered response levels were used, although many psychometricians advocate using seven or nine levels; a recent empirical study found that a 5- or 7-point scale may produce. High mean scores will give the highest possible attainable score, compared to those produced from a 10-point scale, where a little difference in statistical significance like in mean, skewness or kurtosis. (Statistics Café. (n.d.), )

4.8.2 Examples of Likert Scaled Responses Used in Data-Gathering

A variety of methods were available to assist evaluators in gathering data. One of those methods involves the use of a scale. One of the most common scale types is Likert scale. A Likert scale is commonly used to measure attitudes, knowledge, perceptions, values, and behavioral changes. A Likert-type scale involves a series of statements that respondents may choose from in order to rate their responses to evaluative questions (Vogt, 1999).
i. **Level of Effectiveness**

   Level of Effectiveness is measured in a five-point scale prepared to answer each statement in five ways viz. Very Effective, Effective, Somewhat Effective, Ineffective and Very Ineffective by putting tick mark against opinion.

ii. **Level of Librarian Opinion**

   Level of Librarian Opinion measured in a five-point scale prepared to answer each statement in five ways viz. To A Large Extent, To A Moderate Extent, To A Little Extent, To Some Extent and Not At All.

iii. **Level of Satisfaction**

   The scoring is done by giving weights to the responses. The scoring pattern for the responses can be Strongly Agree, Somewhat Agree, Neutral, Somewhat Disagree and Strongly Disagree.

iv. **Level of Adequate**

   The scoring is done by giving weights to the responses. The scoring pattern for the responses can be Very Adequate, Adequate, Somewhat Adequate, Inadequate and Very Inadequate.

v. **Level of Usage**

   The scoring is done by giving weights to the responses. The scoring pattern for the responses can be Very Frequently, Frequently, Quite Frequently, Less Frequently and Not Frequently.

**4.9. Data Analysis**

The data collected were consolidated using MS-Excel, a spreadsheet package. The data were then subjected further statistical treatment by using SPSS package, version 16 following statistical techniques were employed in the present study

a. Descriptive Statistics

b. Chi-square Test/Contingency Table Analysis

   The details of the statistical methods having been applied interpretation of obtained results and verification of the hypotheses are presented in subsequent chapters.
Statistics is the science of Classifying, Organizing and Analyzing the data. Descriptive Statistics has been used to summarize the average age of the subjects, their gender and ethnical position. The investigator has taken up a group of students belonging to different courses to be examined. Hence a sample is a subset of the population. Inferential statistics has been used to make generalizations for samples of population. The researcher has used this to describe findings of effectiveness of library and information services of research scholars which are caused by chance or real phenomena. These 2 functions are solved by Descriptive and Inferential Statistics. Inferential Statistics is used to generalize from samples of populations. The goal is simply to describe as to what was found, for this purpose, descriptive statistics are used. This statistics was used to summarize two major properties of distributions Center Tendency and Variability; in addition Descriptive Statistics was used to summarize relationship between variables. Descriptions statistics has been used to evaluate the outcome of the research.

4.10. Chi Square Test/Contingency Table Analyses

The investigator has conducted the Chi-Square test in terms of frequencies. It is also viewed conceptually as a test of proportions. This test reveals the relative frequencies observed in the several categories of the sample. Frequency distribution is in accord with the set of frequencies hypothesized to be characteristic of the population distribution. The researcher has dealt with the observed frequencies and expected frequencies. Expected frequencies are the mean of the observed frequency that would occur on infinite repetitions of an experiment when sampling is random and the null hypotheses is true.

Chi-Square Test (x) is a measure of discrepancy between expected and observed frequencies. The logic behind the Chi-Square Test, the null hypotheses is that in the population distribution, the proportional frequency of cases in each category equals a specified value. The proportion hypothesized is derived from a research question of interest to the researcher, and as usual the hypotheses concern the population proportions and not the sample proportions. The researcher has seen whether the sample is in reasonable accord with what is hypothesized to be true of the population.
4.11. Spearman's rho Correlation

The Spearman's rho correlation is a non-parametric statistical tool to measure the dependence between two variables. It is also called Spearman's rank correlation coefficient, named after Charles Spearman and often denoted by the Greek letter (rho) or as It assesses how well the relationship between two variables can be described using a monotonic function (not comparable). If there were no repeated data values, a perfect Spearman correlation of +1 or −1 occurs when each of the variables is a perfect monotone function of the other. It can be used when both dependent (outcome or response) variable and independent (predictor) variable are ordinal numeric, or when one variable is an ordinal numeric and the other is a continuous variable. However, it can also be appropriate to use Spearman's correlation when both variables are continuous.

4.12. Conclusion

This chapter describes the methodology adopted for the present study for the purpose of investigation. It deals with the methods, procedure of administering the tools and tests to study the research problem. Further it presents the selection of the sample, tools for the purpose of investigation, psychometric properties of the questionnaires employed, procedure, main study, and Time period of data collection, data analysis and scoring analysis to get the meaningful results on the total selection of the sample. This provides the base for the major study.