CHAPTER – IV

RESEARCH DESIGN

Any researcher will give more attention on selecting research methods to find answers to the research study. This chapter deals with the sampling procedure used for selection of study area and the respondents. It also deals with the variables selected for the study procedures used for measuring the variables, data collection methods and statistical tools used for analysing the data.

4.1 OBJECTIVES OF THE STUDY

1. To find out the users attitudes and approaches towards e-resources and services in the academic libraries of Pondicherry Union Territory.

2. To evaluate the electronic resource use pattern among the respondents in the study area.

3. To know the existing e-services in the academic libraries of Pondicherry Union Territory.

4. To know the various sources used by the respondents in the affiliated arts and science colleges and Pondicherry Central University library.

5. To examine the extent of use of the library facilities and services made to the Faculty, research scholars and students.
6. To determine the relative of different sources of library information used by the respondents.

7. To know type of internet search engines used to collect the required information.

8. To assess respondents’ satisfaction on the availability and utilization of library resources and services.

### 4.2 HYPOTHESES

**Meaning**

Hypothesis may be defined as a proposition or a set of propositions set forth as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional conjunction to guide some investigation or accepted as highly probable in the light of established facts. Quite often a research hypothesis is a predictive statement, capable to some dependent variable.

The following hypotheses are formulated on the basis of content and coverage of framed objectives and they are tested by employing appropriate statistical techniques:

- Users differ in their assess and approach towards the e-resources of affiliated arts and science colleges to Pondicherry Central University.
• Users differ in their opinion about e-services for various affiliated arts and science colleges to Pondicherry Central University.

• There is a significant difference in the sources used by the affiliated colleges library.

• There is a significant difference in the extent of use of the library facilities and services made to the faculty and students.

• Users differ in their sources of information used for their purpose.

• Users differ in type of internet search engines used to collect the information

• Users differ in their satisfaction on the availability and utilization of library resources and services.

4.3. METHODOLOGY

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, we study the various steps that are generally adopted by a researcher in studying the research problem along with the logic behind them.

The preparation of the research design, appropriate for a particular research problem involves usually the consideration of the following;

1. The means of obtaining the information

2. The availability and skills of the researcher and his staff (if any);
3. Explanation of the way in which selected means of obtaining information will be organized and the reasoning leading to the selection.

4. The time available for research;

5. The cost factor relating to research, i.e., the finance available for the purpose.

4.4 SAMPLING

In this research the researcher selected 12 arts and science colleges affiliated by the Pondicherry Central University and One Pondicherry Central University. 100 samples were selected randomly from the Pondicherry Central University. Further from the 12 arts and science colleges, 100 samples from each college were taken as the sample on the basis of stratified random. Out of 12 arts and science colleges four self-finance and eight government colleges were covered. Therefore totally 1300 samples were selected and questionnaires were distributed individually. Among them 1250 questionnaires were selected for the study as samples and the remaining 50 questionnaires were rejected due to incomplete responses.

4.5 DATA COLLECTION

There are two type’s data viz., primary and secondary. The primary data are those which are collected by the researcher. The
secondary data, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process. The researcher would have to decide which sort of data he will be using for his study and accordingly, he will have to select one or the other method of data collection.

The methods of collecting primary and secondary data differ since primary data are originally collected while in case of secondary data, the nature of data collection work is merely that of compilation.

There are several ways of collecting the appropriate data which differ considerably in context of money, time and other resources at the disposal of the researcher.

Primary data can be collected either through experiment or through survey. If the researcher conducts an experiment, he observes some quantitative measurements, or the data, with the help of which the researcher examines the truth contained in his hypothesis. But in the case of a survey, the following ways are used to collect the data:

Sidney and Beatrice Webs stated that, “A widely broadcast questionnaire is usually available for anything more than obtaining data of the statistician. It may be furnish confirmation of hypotheses, but it is very rare that it brings to light facts of structure and function not already
with in the knowledge of the investigator, or at least definitely suspected by him to exist.”

A well-structured interview schedule was used for the collection of data. Interview schedule was prepared in English by the student researcher for administration. Before finishing the interview schedule it was pre-tested in a non-sample area to identify the inconsistencies and later necessary change were made in the interview schedule. The copy of the finalized English interview schedule is given in Appendix I. Data collected were processed and tabulated for statistical analysis.

Research design into the following parts:

a. The sampling design which deals with the method of selecting items to be observed for the given study;

b. The observational design which relates to the conditions under which the observations are to be made;

c. The statistical design, which concerns with the techniques by which the procedures specified in the sampling, statistical and observation designs can be carried out.

**Features of a research design:**

1. It is a plan that specifies the sources and types of information relevant to the research problem.

2. It is a strategy specifying which approach will be used for gathering and analysing the data.
3. It also includes the time and cost budgets since most studies are done under these two constraints.

4.6 DATA ANALYSIS

A simple percentage analysis was carried out on the data extracted from the questionnaire based on domain, gender and designation etc.,

4.7 STATISTICAL TECHNIQUES USED

To test the hypotheses, Analysis of Variance (Two way ANOVA), t-test and Chi-square test was carried out. The general data interpretation is done with the application of percentage analysis. The diagrammatic and graphical representations of the data are also made on requirement of the study.

Cross tables, Chi-square test, t-test and One-way ANOVA were used in the study by using Statistical Software SPSS (Statistical Package for Social Sciences).

PERCENTAGE ANALYSIS

Percentage refers to a special kind of ratio. Percentages are used in making comparison between two or more series of data to describe the relationships. Percentages can also be used to compare the relative terms, the distribution of two or more series of data
No of Respondents \[ \% = \frac{\text{No of Respondents}}{\text{Total no of Respondents}} \times 100 \]

**TESTS OF SIGNIFICANCE**

A very important aspect of the sampling theory is the study of tests of significance which enable us to decide on the basis of the sample results if:

1. The deviation between the observed sample satisfaction and the hypothetical parameter value is significant.

2. The deviation between two sample statistics is significant.

**STATISTICAL TECHNIQUES USED**

- Descriptive analysis (Mean and Standard Deviation),
- Inferential analysis

The means, standard deviations of the entire sample are computed. In order to test the significance ‘t’ test is used. In order to find out the significance of more than two variables, ‘F’ test is also used in this present investigation.
a. Mean

The mean of a distribution is commonly understood as the arithmetic average. It is perhaps the most familiar, most frequently used and well understood average.

The mean of a set of observations or scores is obtained by dividing the sum of all the values by the total number of values.

a) for ungrouped data

\[ M = \frac{\sum X}{N} \]

b) for grouped data

\[ M = \text{A.M} + \frac{\sum f_i x_i}{N} \]

b. Standard deviation (σ)

The average of squared deviations of the measures of scores from their mean is known as the variance. The standard deviations is the positive square root of variance.

a) for ungrouped data

\[ \sigma = \sqrt{\frac{\sum x^2}{N}} \]

b) for grouped data
c. Differential analysis

Differential analysis is an important procedure by which the researcher is able to make inferences involving in the determination of the statistical significance of difference between groups with reference to selected variables. It involves the use of ‘t’ test. A ‘t’ test is a numerical procedure that takes into account that the difference between means of two groups, the number of subjects in each group and the amount of variation of present in the score. Thus the ‘t’ test is used to determine whether the performance of two groups is significant or not.

d. t-Test

Statistics will help us to find whether one group differs from another set or not. We calculate the mean of each group and then find out whether the means of the two groups differ or not. To find out the difference between two means we use ‘t’ test.

e. 'F' test

In order to find out the significant difference of three and more variables, 'F' test is used. The formula for the 'F' test is

\[ F \text{ ratio} = \frac{\text{mean square between}}{\text{mean square with in}} \]
**CHI-SQUARE TEST**

The Chi-square test whether we are given a set of observed frequencies obtained under some experiment and we want to test if the experimental result support a particular hypothesis or theory.

The steps involved chi-square tests are as follows:

1. Observed frequencies $O$ are tabulated.
2. Expected frequencies $E$ are calculated.
3. The difference between observed and expected frequencies are obtained and square of these difference are tabulated $(O-E)^2$.
4. The values of $(O-E)^2$ obtained in step 3 are divided by the respective expected frequency and the total $(O-E)^2 / E$ is obtained.
5. The calculated of $X^2$ is compared with the table value of $X^2$ for given degree at a certain level of significance (generally 5% or 1% level selected).

By degrees of freedom we mean the number of classes to which the value can be assigned arbitrarily if at the 5% or 1% level of significance the calculated value of $X^2$, the difference between theory and observation is considered to be significant. On the other hand, the calculated value of $X^2$ is not considered as significant i.e., it is regarded as due to fluctuations of sampling and hence ignored.
\[ \chi^2 = \frac{(O-E)^2}{E} \]

\( O \) = Observed frequency

\( E \) = Expected frequency

### 4.8 CONCEPTS

The following concepts are operationally defined for the purpose of the present study.

**Information:**

Information is a sensible statement, an opinion, fact, concept, an idea or an association of statements, opinions or ideas”.

**Users:**

Users are the person come and seek information in the library for their needs.

**User studies:**

User studies’ comprises the study of people’s need for, and use of, information. A user study may be defined as a systematic study of information requirements of users in order to facilitate meaningful exchanges between information systems and users.
**Information channels:**

Channels are the means by which ideas, opinions, facts, and interpretations are communicated. These channels may be formal books, journals, research reports, slides, audio-tapes, gramophone records, films-or inform-after-dinner discussions, casual meetings with colleagues, correspondences.

**4.9 LIMITATIONS OF THE STUDY**

The study is restricted to only students, research scholars and faculties of Pondicherry Central University and affiliated arts and science colleges in Pondicherry. The study lacks in evaluating the fund generation, fund utility and expectation due to lack of information. Though, the researcher circulated 1300 questionnaires a proper replay has been received from 1250 respondents only and those 1250 respondents perfectly answered questionnaires are selected and such respondents are considered as sample for the study. In this library performance has been analysed mainly from the point of view of the users.
4.10 NEED FOR RESEARCH DESIGN

Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money.

4.11 SIGNIFICANCE OF THE STUDY

Library is one of the important resource for inputting the knowledge to the human being. Especially in the colleges the Library play a significant role for the teachers, scholars and students to enrich their knowledge and also to know their latest information. In the present situation every where e-resources play a significant role. Studying of effectiveness of e-resources and the users attitude about e-resources are very significant one for any libraries for their development. In this context, the performance of the college libraries are very significant one. So the researcher make an attempt to adjudication of the performance by the Library users in the arts and science colleges affiliated to Pondicherry central university. Through the evaluation the colleges have an idea regarding the updation and further development also they are able to know the users attitude about the Library services. Therefore based on the above context this research is significant one.
4.12 SCOPE OF THE STUDY

The methods adopted for this study are descriptive, analytical and comparative. The target group of this study includes faculty members, Research Scholars and students of Pondicherry central university and affiliated arts and science colleges. The target respondents in other affiliated colleges of Pondicherry central university, Tamil Nadu are not included in this study as this study coming under the preview of case study. There is a scope for other future researchers to take this area for the study. The geographical area of this study is confined only to Pondicherry central university students. This study related to the available online information centres such as Pondicherry central university library at various departments, offices and students amenities centers on campus.

4.13 TOOL FOR COLLECTING DATA

For this study both primary and secondary data are collected. The primary data are collected from the faculty members, Research scholars both M.Phil and Ph.D. and students of arts and science Colleges Affiliated to Pondicherry Central University. Secondary data are collected from various Books, Journals, Magazines, Newspapers and records of the selected institutions.
By Observation:

This method implies the collection of information by way of investigator’s own observation, without interviewing the respondents. The information obtained relates to what is currently happening and is not complicated by either the past behavior or future intentions or attitudes of respondents. This method is no doubt an expensive method and the information provided by this method is also very limited. As such this method is not suitable in inquiries where large samples are concerned.

Through Personal Interviews:

The investigator follows a rigid procedure and seeks answers to a set of pre-conceived questions through personal interviews. This method of collecting data is usually carried out in a structured way where output depends upon the ability of the interviewer to a large extent.

4.14 SAMPLING TECHNIQUE

For this study stratified Random sampling method was adopted for collecting Primary data. There are users in colleges affiliated to Pondicherry Union Territory. A sample including faculty members, research scholars and students were chosen from each of the sample size.
Out of 12 arts and science Colleges and one Pondicherry Central University, 1250 samples were selected for the present study. They were selected randomly.

4.15 SUMMARY

In the present chapter the research design, objectives, hypotheses, sample size and techniques and statistical techniques used are clearly explained. Further in the next chapter the analysis and interpretations were briefly discussed.