

METHODOLOGY

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A system of models, procedures and techniques used to find the result of a research problem is called research methodology. It refers to the philosophy on which the research is based. Research methodology involves the systematic procedures by which the researcher starts from the initial identification of the problem to its final conclusions. The role of methodology is to carry on the research work in a scientific and valid manner. The method of research provides the tools and techniques by which the problem is approached.

The present study is an investigation to understand the level of information literacy of the research scholars of the various universities in Kerala. The methodology followed for the study is described under the following headings.

1. Variables used for the study
2. Objectives of the study
3. Hypotheses of the study
4. Sample used for the study
 - 4.4.1. Sampling technique used
 - 4.4.2. Sample size
 - 4.4.3. Break up of the sample
5. Tool used for data collection
6. Data collection procedure
7. Consolidation of data
8. Statistical techniques used

4.1. VARIABLES USED FOR THE STUDY

The variables used for the study are broadly divided into two, namely classificatory variables and study variables. The variables are selected in accordance with the literature reviewed for the purpose and the information literacy standards of Association of College and Research Libraries (ACRL).

The major performance indicators under the information literacy standards are taken as the study variables of the study. They are as follows:

- Awareness about the various information sources
- Method used for locating information
- Method used for retrieving information from various sources
- Parameters used for evaluating information
- Computer literacy of the research scholars

The classificatory variables used for the study are:

Qualification

Post Graduation

M. Phil

Gender

Male

Female

Discipline

Science

Humanities

Social Sciences

4.2. OBJECTIVES OF THE STUDY

The overall objective of the study is to assess the information literacy skills of the research scholars of the universities in Kerala.

The following are the objectives considered to achieve the overall objective of the study.

1. To study about the ability of research scholars in determining the nature and extend of the information need in their research work.
2. To know research scholars ' ability to identify a variety of types and formats of potential information sources in their research work.
3. To assess the ability of research scholars to search, locate and retrieve information from various information sources.
4. To assess the ability of the research scholars to evaluate the information.
5. To assess the research scholars ability to use the information efficiently and effectively for their research purpose.
6. To assess the research scholars knowledge about sociological, political and legal implication of the use of information.
7. To assess the research scholars ability to present the research findings.
8. To assess the research scholars ability to communicate the research findings.
9. To know the opinion of the research scholars about the importance of information literacy and the need for teaching information literacy as part of their curriculum.

4.3. HYPOTHESES OF THE STUDY

The pilot study conducted on the information literacy skills of the research scholars of various universities shows that they are almost information literate. To be more specific and clear the study proceeds with the following hypotheses.

1. Research scholars are able to determine the nature and extent of their information needs in their research work.
2. Research scholars are capable to identify the appropriate information sources to collect appropriate information required for their research purposes.
3. Research scholars are able to search, locate and retrieve information from various information sources.
4. Research scholars can use appropriate methods as evaluation criteria while selecting information for their research purpose.
5. Research scholars are able to use the information effectively.
6. Research scholars are aware about the social, political and legal implication of the use of information.
7. Research scholars do not know how to present the research findings.
8. Research scholars know how to communicate the research findings.
9. Research scholars are of the opinion that there is need for including information literacy as part of their curriculum.
10. There exists no significant difference among different categories of research scholars regarding the need for the study other language,

ability to write keywords, knowledge about synonyms, use of search techniques and ability in manipulating digital test images and data.

4.4. SAMPLE USED FOR THE STUDY

The population of the present study is the full time research scholars of the Universities in Kerala. However, it is not practical to study the whole population and to arrive at generalisations, though the result of the research is to have universal application. The process of sampling makes it possible to draw valid inferences or generalisations on the basis of careful observation of variables within a relatively small proportion of population.

There are eight arts and science universities in Kerala. Out of these eight universities, the investigator has selected the full time research scholars from four universities. On the basis of classificatory variables, the investigator collected data from the research scholars doing research in different departments coming under different faculties of University of Kerala, University of Calicut, Mahatma Gandhi University, and Cochin University of Science and Technology.

There were provision for part time and full time Ph.D programmes in the four universities. But presently University of Calicut and University of Kerala are allowing only full time Ph. D programmes. Only full time research scholars are taken for the study. As per the records, there are 1460 research scholars doing full time research in the four universities taken for the study. A sample of 600 research scholars were taken for the study and distributed questionnaires, out of this, 511 questionnaires were received back.

4.4.1. Sampling Technique

For the selection of the sample size the investigator used a sample formula of Creative Research System of American Marketing Association.¹

Sample Size

$$Ss = \frac{Z^{2*} (P)^* (1-p)}{C^2}$$

Z = Z Value (eg> 1.96 for 95% confidence level)

p = Percentage of picking a choice' expressed as decimal)

c = confidence interval expressed as decimal.

4.4.2. Sample Size

Using this formula the minimum sample size to be selected for the study is 426 in 95% confidence level and confidence interval is 4. In this study 600 samples were selected for study which is sufficient and accurate for getting valid inferences and generalisations

The break up of the sample is as follows:

Number of universities taken for study = 4

Samples from each university = 150

Total sample = 600 (150 x 4 = 600)

4.4.3. Break Up of the Sample

Questionnaire was distributed in such a way so as to give representation to all research scholars under different faculties. Some of the respondents did not returned the questionnaires and some of the questionnaires return were incomplete. Hence a final sample of 511 questionnaires completed in all aspect was selected for the study. The break up of the final sample is given in table 4.1 to 4.6.

4.4.3.1 Gender-wise Distribution of Sample

On the basis of the gender selected for the study, the sample break up is given in the table 4.1.

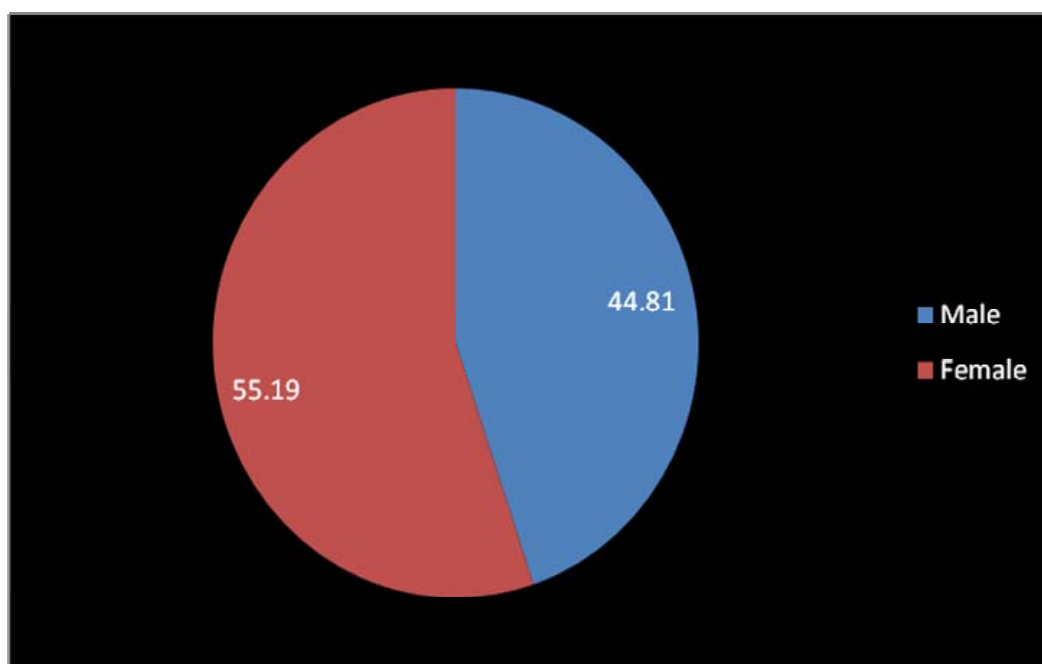
Table 4.1
Gender-wise Distribution of Sample

Gender	Number	Percentage
Male	229	44.81
Female	282	55.19
Total	511	100.00

Table 4.1 gives an account on the gender-wise distribution of the respondents. Table shows that out of total 511 respondents 229(44.81 per cent) are males and 282(55.19 per cent) are females. Female research scholars are higher in number compared to male doing research.

The pictorial representation of gender-wise distributions of the respondent is given in figure 4.1.

Figure 4.1
Gender-wise Distributions of Sample



4.4.3.2 Qualification-wise Distribution of Sample

Qualification-wise distribution of the sample selected from various universities is given in the table 4.2.

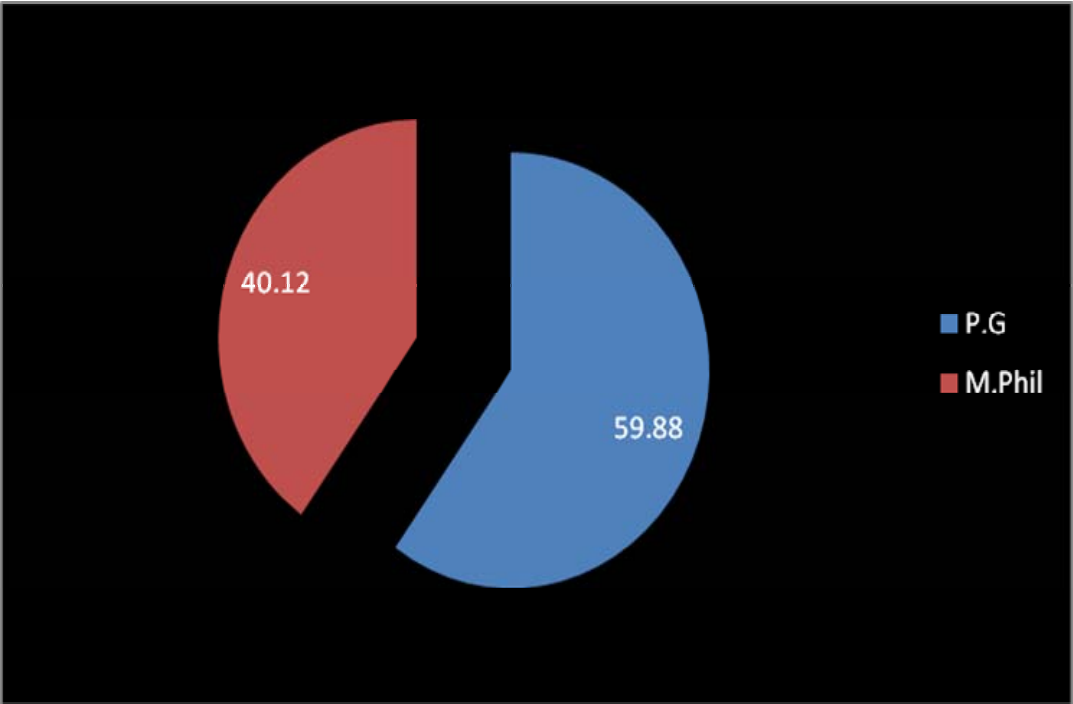
Table 4.2
Qualification -wise Distribution of Sample

Education	Number	Percentage
P.G	306	59.88
M.Phil	205	40.12
Total	511	100.00

Table 4.2 gives the qualification details of the respondents. It is found that out of the total 511 respondents 306(59.88 per cent) are post graduate degree holders and 205(40.12 per cent) of them are M. Phil degree holders. It shows that more than half of the research scholars are postgraduate degree holders.

The figure 4.2 represents the qualification-wise distribution of Sample.

Figure 4. 2
Qualification -wise Distributions of Sample



4.4.3.3 Discipline-wise Distribution of Sample

Discipline-wise distribution of the sample selected from various universities is given in the Table 4.3.

Table 4.3

Discipline-wise Distribution of Sample

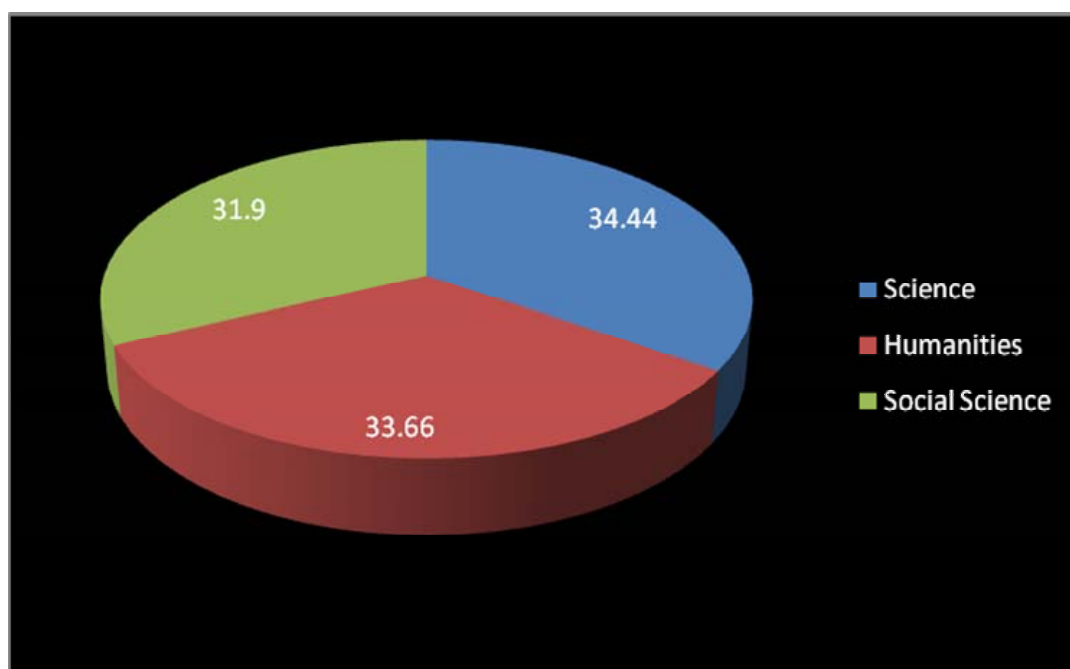
Discipline	Number	Percentage
Science	176	34.44
Humanities	172	33.66
Social Science	163	31.90
Total	511	100.00

Table 4.3 gives an idea regarding the faculties or disciplines under which the respondents belong. In the present study the research scholars fall under three faculties, they are science (34.44 per cent), humanities (33.66 per cent) and social science(31.90 per cent). It is clear that science research scholars stands first (in number) doing research, followed by humanities and social science research scholars.

Graphical representation of the discipline –wise distribution of sample is given in figure 4.3.

Figure 4.3

Discipline-wise Distribution of Sample



4.4.3.4. Category-wise Distribution under Different Disciplines of Sample

On the basis of the categories selected for the study under different faculties, the sample break up is given in the given in the following table 4.4.

Table 4.4
Distribution of the Sample

Universities	Faculties	University research scholars		JRF		SRF		FIP		Total	
		Distri Buted	Respo nded	Distri buted	Respo nded	Distri buted	Respo Nded	Distri buted	Respo nded	Distri buted	Respo nded
University of Kerala	Science	15	15	15	15	15	12	5	3	50	45
	Humanities	15	13	15	14	15	15	5	3	50	45
	Social Sciences	15	11	15	12	15	12	5	3	50	38
	Total	45	39	45	41	45	39	45	9	150	128
University of Calicut	Science	15	14	15	14	15	14	5	4	50	46
	Humanities	15	14	15	14	15	13	5	4	50	45
	Social Sciences	15	14	15	13	15	13	5	3	50	43
	Total	45	42	45	41	45	40	15	11	150	134
Mahatma Gandhi University	Science	15	13	15	14	15	14	5	4	50	45
	Humanities	15	14	15	13	15	14	5	4	50	45
	Social Sciences	15	13	15	12	15	13	5	2	50	40
	Total	45	40	45	39	45	41	15	10	150	130
Cochin University of Science and Technology	Science	15	13	15	13	15	11	5	3	50	40
	Humanities	15	12	15	10	15	12	5	2	50	36
	Social Sciences	15	19	15	12	15	10	5	2	50	43
	Total	45	44	45	35	45	33	15	7	150	119
Total		180	165	180	156	180	153	60	37	600	511

Among the four universities selected (University of Kerala, University of Calicut, Mahatma Gandhi University and Cochin University of Science and Technology), research scholars fall under three faculties, science, humanities and social science. The table 4.4 gives an overview regarding the distribution of the sample taken.

In University of Kerala, out of the 128 respondents, 45 of them belong to science faculty, another 45 of them belongs to humanities and 38 of them come under social science. Out of these respondents, 39 of them are university research scholars, 41 of them are junior research fellows, 39 of them are senior research fellows and 9 of the research scholars comes under FIP.

In University of Calicut, out of the 134 respondents, 46 of them belong to science faculty, 45 of them come under humanities and 43 of them belong to social science. Out of these respondents, 42 of them are university research scholars, 41 of them comes under junior research fellows, 40 of them are senior research fellows and 11 of the research scholars comes under FIP.

In Mahatma Gandhi University, out of the 130 respondents, 45 of them belong to science faculty, another 45 of them comes under humanities and 40 of them belong to social science. Out of these respondents, 40 of them are university research scholars, 39 of them comes under junior research fellows, 41 of them are senior research fellows and 10 of them belong to FIP.

In Cochin University of Science and Technology, out of the 119 respondents, 40 of them belong to science faculty, 36 of them belong to humanities and 43 of them belong to social science. Out of these respondents, 44 of them are university research scholars, 35 of them are junior research fellows, 33 of them are senior research fellows and 7 of them belong to FIP.

4.4.3.5 Category-wise Distribution of Sample

On the basis of the categories selected for the study, the sample break up is given in the following table.

Table 4.5

Category-wise Distribution of Sample

Universities	University research scholars		JRF		SRF		FIP		Total	
	Distri Buted	Respo nded	Distri Buted	Respo nded	Distri buted	Respo nded	Distri buted	Respo nded	Distri buted	Respo Nded
University of Kerala	45	39	45	41	45	39	15	9	150	128
University of Calicut	45	42	45	41	45	40	15	11	150	134
M.G University	45	40	45	39	45	41	15	10	150	130
CUSAT	45	44	45	35	45	33	15	7	150	119
Total	180	165	180	156	180	153	60	37	600	511

Table 4.5 gives an idea regarding the category-wise distribution of sample. It reveals that in the University of Kerala, out of the 128 respondents, 39 of them are university research scholars, 41 of them are junior research fellows, and 39 of them are senior research fellows and 9 of the research scholars comes under FIP.

In University of Calicut, out of the 134 respondents, 42 of them are university research scholars, 41 of them comes under junior research fellows, 40 of them are senior research fellows and 11 of the research scholars comes under FIP.

In Mahatma Gandhi University, out of the 130 respondents, 40 of them are university research scholars, 39 of them comes under junior research fellows, 41 of them are senior research fellows and 10 of them belong to FIP.

In Cochin University of Science and Technology, out of the 119 respondents, 44 of them are university research scholars, 35 of them are junior research fellows, 33 of them are senior research fellows and 7 of them belong to FIP.

4.4.3.6 Gender-wise distribution of sample

Gender-wise distribution of sample coming under the different faculties is given in the table 4.6.

Table 4.6

Gender-wise Analysis of the Sample

Universities	Science		Humanities		Social science		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
University of Kerala	20	25	20	25	17	21	57	71
University of Calicut	20	26	21	24	15	28	56	78
M.G University	22	23	20	25	20	20	62	68
CUSAT	20	20	18	17	16	28	54	65
Total	82	94	79	91	68	97	229	282

It is found from the table that in University of Kerala, among science research scholars, 20 of them are male and 25 of them are females. Among

the humanities research scholars, again 20 of them are male and 25 of them are females, and among social science research scholars 17 of them are males and 21 of them are females.

In University of Calicut, out of the total 56 male research scholars, 20 belongs to science, 21 belong to humanities and 15 belong to social science. Out of the 78 females, 26 belongs to science, 24 to humanities and 28 to social science.

In Mahatma Gandhi University, out of the 62 male research scholars, 22 belong to science, 20 to humanities and 20 to social science. Among the 68 female respondents, 23 belong to science, 25 to humanities and 20 to social science.

In CUSAT, out of the 54 male research scholars, 20 of them are science research scholars, 18 of them are humanities research scholars and 16 of them are social science research scholars. Among the 65 female research scholars, 20 belong to science, 17 to humanities and 28 to social science faculty.

4.5. TOOLS USED FOR DATA COLLECTION

The investigator used questionnaire method for data collection. A questionnaire was administered for collecting the required primary data. The investigator directly distributed the questionnaires to the research scholars of the various departments in the four universities taken for the study.

4.5.1. Questionnaire Based on ACRL's Information Literacy Standards

Questionnaire is a widely employed tool for data collection in research. It is a systematic compilation of questions logically related to the problem under the study. Structured questions were prepared after consultation with the supervising teacher. The questionnaire has two parts. The first part deals

with the personal information regarding the research scholars and it contains five items such as, name of the university, name of the scholar, gender, qualification, category of research scholars like university research scholars, junior research fellow, senior research fellow, FIP and the faculty under which the research scholars are doing research. Necessary instructions were given at appropriate places to help the respondents in filling the questionnaire.

The second part of the questionnaire deals with the user perception and opinion of the research scholars about the different aspects of information literacy according to the study variables used for the research work and based on the performance indicators and outcomes of ACRL's information literacy standards. Description of data collected under these heads is detailed below.

4.5.1.1. Research scholars' ability to recognise the need for information

It refers to whether the research scholars are able to recognise the need for information when there is a need.

4.5.1.2. Need and importance of information literacy for research scholars

Research scholars are requested to reveal their opinion regarding the importance of information literacy.

4.5.1.3 Research scholars' ability to identify the variety of information sources

It refers to whether the research scholars are able to identify the variety of information sources.

4.5.1.4 Research scholars' ability to search, locate and retrieve information

It refers to whether the research scholars are able to search, locate and retrieve information from different information sources.

4.5.1.5 Research scholars' ability in evaluating, using and communicating information etc.

It indicates to whether the research scholars are able to evaluate, use and communicate information.

4.5.1.6 IT Literacy

Questions relating to assess the computer knowledge of research scholars and the methods they have chosen for attaining computer knowledge are included.

The questionnaire consists of 32 questions to understand the level of information literacy of research scholars. The well-structured questionnaires were distributed among the research scholars of four universities in Kerala.

4.5.2. Examination of Records

In order to collect the data on the number of research scholars and other background information, the investigator examined the annual reports and websites of the four universities under study.

4.5.3. Review of Related Literature

In order to get an idea about similar studies conducted in the present research area an exhaustive literature search was carried out. For this, many primary periodicals, online journals, online databases, secondary periodicals like LISA, bibliographies etc. were consulted. The review assisted the investigator to gain better understanding of the subject.

4.6. DATA COLLECTION PROCEDURE

Sufficient copies of the questionnaires were prepared initially. The investigator then personally visited all the four universities and distributed the

questionnaires to the research scholars. The questionnaires distributed were collected with the help of department librarians. Most of the research scholars were responded positively by filling up and returning the same. The experience was encouraging.

4.7. CONSOLIDATION OF DATA

Data pertaining to classificatory and study variables were consolidated separately by using spreadsheet package ‘Excel. The data were then subjected to further statistical treatment by using the statistical package ‘Statistical Package for Social Sciences’ (SPSS).

4.8. STATISTICAL TECHNIQUES USED

The investigstor used mainly two statistical techniques at different stages of the study to draw the conclusions. They are:

- ◆ Percentage analysis
- ◆ Chi-square Test

4.8.1. Chi-square Test

The Chi-square test (χ^2) is one of the simplest and most widely used non-parametric tests in statistical analysis. Chi-square is a measure of actual divergence of the observed and expected frequencies (or values). If there is no difference between actual and observed frequencies, the value of the chi-square is zero. The greater discrepancy between observed and expected frequencies, the greater is the value of Chi-square (χ^2). If the calculated value of chi-square is less than the table value, it indicates that there exists a difference between actual observed frequencies which may have arisen due to chance of fluctuation and can be ignored. The quantity χ^2 is defined as

$$\chi^2 = \sum (O-E)^2 / E$$

Where 'O' refers to the observed frequencies and 'E' refers to the expected frequencies. Steps to determine the value of χ^2 are

- I. Calculate the expected frequencies.
- II. Take the difference between observed and expected frequencies and obtain the square of these difference i.e. obtain the value of $(O-E)^2$.
- III. Divide the quantity $(O-E)^2$ obtained in step (ii) by the expected frequency and obtain the sum over all cells $\sum (O-E)^2 / E$.

This gives the value of χ^2 and is compared with the table value of χ^2 for given degree of freedom at certain specific level of significance. If the calculated value χ^2 is more than table value of χ^2 the difference between the theory and observation is considered to be significant; i.e. it could not have arisen due to fluctuations of simple sampling. If, on the other hand, the calculated value of χ^2 is less than the table value, the difference between theory and observation is not considered as significant i.e. it is regarded as due to fluctuations of simple sampling and hence ignored ([www.2 Iv.Psu.edu/ixm57/irp/chisquar.html](http://www2.Iv.Psu.edu/ixm57/irp/chisquar.html)).²

For the present study Chi-square test was employed to test the association between the categories whenever necessary. For this, two way tables to observed frequencies for the four categories were obtained first and then chi-square value corresponding to each cell of the two way table were computed and some of these chi-square values were calculated. If the computed value is greater than table value it indicates that there is an association (dependence) between the categories. Otherwise the four categories were independent.

4.9. CONCLUSION

This chapter has summarized the methodology adopted in the present study including the tools and procedure for data collection and statistical techniques for data analysis. The next chapter furnishes the analysis and interpretation of data.

References

1. American Marketing Association. (2010). Creative Research System. Retrieved May 18, 2010, from www.surway system.com on.
2. Chi-Square test. (2010). Retrieved February 22, 2010, from www.2Iv.Psu.edu/ixm57/irp/chisquar.html.