CHAPTER-III
METHODOLOGY
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3.0 Introduction

Research means applying scientific methods in order to study problems. The success in the field of research is attained by the proper adoption of methodology, which also helps in achieving the objectives of the work. Research methods are those which are helpful for conducting the study. In other words, research methods mean all those means used by a researcher during the course of studying his or her own research problem. These are of utmost importance for carrying out a research study in a smoother way and to draw out valid conclusions. Research is always logical, objective and systematic and it is the process of searching new facts and data on a specific subject. It systematically finds the solution of problems by employing scientific methods. It enriches the existing knowledge in the light of the new contributions. Research includes defining the problems, objective and hypothesis formulation, collection of data, analysis and interpretation of data etc.

The main features of research thus include the following.

1. Research is a way of solving problems.

2. Expertisation is required for successful research.

3. Research explores new knowledge.

4. Research needs observation accurately.

5. Research is based on empirical evidences.
This chapter discusses about the research design adopted for the present study. The various methods and materials used for data collection and analysis are explained under the following headings in this present chapter.

3.1 Research design applied for the present study

3. 2. Population of the study

3. 3. Sample of the study

3. 4. Tools

3. 5 Data collection procedures

3. 6 Collection of secondary data for the present study

3. 7 Statistical techniques used for data analysis

3.1 Research design applied for the present study

Research design is best termed as a blueprint of the research process which helps to understand how the researcher collects the data, measures, analyses and interprets them. It reveals the entire research setting. It is an advance planning of the methods to be used for collecting relevant data and analyze them for the work.

Methods and techniques constitute important parts of any research design. Research methods are classified into different types from different angles. According to Koul, Lokesh. (2006), the most widely used classification of research methods are as follows.

1. Historical method.
2. Descriptive method.

3. Experimental method.

All the methods applied in Social Science research fall under one of or a combination of the aforesaid methods.

Descriptive research is the most popular and widely used research method in education. It helps to obtain accurate and valid information regarding the current status of phenomena and to draw out valid conclusions from the facts discovered. This method is of immense use for solving problems about children, curriculum, teaching methods and evaluation, school organization, supervision etc. It involves measurement, classification, analysis, comparison and interpretation of data and not merely collection of data.

Following properties constitute descriptive survey method.

1. Problem selection for the study.

2. Defining the problem.

3. Data identification.

4. Selecting and developing tools of collecting data.

5. Defining population and sample selection.

6. Data collection.

7. Data analysis and interpretation.

8. Preparing the research report.
So, it became apparent from the aforesaid discussion that the present problem, ‘Perception and attitude of college students towards computer education in the Nagaon district of Assam: A study’ had all the features of a research problem that could be conducted by employing descriptive survey method, as it aimed at assessing the present status of computer education and students’ perception and attitude towards it, who were enrolled in various computer education courses in the general degree colleges of Nagaon district of Assam.

3.2 Population of the study

Population denotes universe. Adoption of proper sampling procedures and selection of representative sample are possible only when population is well defined. Simultaneously, it helps the researcher to select proper methodologies and tools to be used for the research study.

In the present study, population represented all the students pursuing computer education in the general degree colleges of Nagaon district of Assam. In order to know the students’ strength, the investigator visited all the colleges and collected the number of students enrolled in different courses of computer education in the concerned colleges.

Investigator visited all those colleges for collecting data necessary for the study. For that, the investigator supplied an attitude scale and a questionnaire for knowing the perception and attitude of students towards computer education. The different statements and questions included in the attitude scale and questionnaire represented various objectives of the research study. Students for this study were
selected on the basis of proportionate stratified random sampling under probability sampling plan.

There were ten (10) general degree colleges in Nagaon district which introduced different courses of computer education of which five (5) were urban and five (5) were rural colleges. The total population of those colleges was 1127 (Male 587 and Female 540). The urban colleges had the population of 482 (Male 219 and Female 263) and the rural colleges had 645 (Male 368 and Female 277) (According to the data received from the sample colleges).

Below in the Table 4 and Figure 3, the students’ population ensuing computer education courses of the colleges were shown.

**Table 4**

**Population distribution of the study**

<table>
<thead>
<tr>
<th>POPULATION-1127</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN(482)</td>
</tr>
<tr>
<td>MALE</td>
</tr>
<tr>
<td>219</td>
</tr>
</tbody>
</table>
3.3 Sample of the study

Sample denotes the miniature representation of the large population. It is defined as a finite part of a statistical population and its properties are studied in order to gain information about the population (Webster, 1985).

According to Saha, Kaberi (2012; Statistics in Education and Psychology, pp 131) sampling methods are divided into two large categories namely,

- Probability sampling
- Non-probability sampling

The different types come under probability sampling are,

- Simple random sampling
- Stratified random sampling
- Systematic random sampling
- Cluster sampling
-Multi-stage sampling

On the other hand, the types of non-probability sampling are,

- Incidental/Accidental sampling
- Purposive sampling

For the present study, as per the convenience and need, the investigator selected samples.

### 3.3.1 Sampling method

After defining the population, the investigator has to immediately design an appropriate sample for the study. A sample design is therefore a plan for obtaining a sample from a given population. It means the techniques and procedures the researcher adopts in selecting items in the sample. Selecting appropriate sample design helps the investigator to collect data in a systematic way, thus saves the time and energy. Descriptive survey method was used for the study and for selecting the sample; stratified random sampling (proportionate) that comes under probability sampling design was used.

### 3.3.2 Sample size

The total population of students pursuing computer education in the general degree colleges in the Nagaon district was 1127 during the academic session 2014-15. The investigator selected 30% students from the total population as sample for the present study, thus a total 338 students were selected as sample. The general degree colleges in this study were divided as rural colleges and urban colleges. So,
the investigator divided the selected samples on the basis of locality of colleges and selected 30% students proportionately both from rural and urban colleges. Thus, the sample of students from rural colleges was 193 and from urban colleges it was 145. Again, the investigator selected 30% students each from the male and female students’ population in the rural and urban colleges. Thus, male and female students’ samples from rural colleges were 110 and 83 respectively, whereas male and female students’ samples from urban colleges were 66 and 79 respectively. Thus, a total 338 students were selected for the present study.

Below in Table 5 and Figure 4, the distribution of sample for the present study was shown.

Table 5
Sample distribution of the study

<table>
<thead>
<tr>
<th></th>
<th>TOTAL SAMPLE-338 (30%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>URBAN (145) (30%)</td>
<td>RURAL (193) (30%)</td>
</tr>
<tr>
<td>MALE</td>
<td>FEMALE</td>
</tr>
<tr>
<td>66(30%)</td>
<td>79(30%)</td>
</tr>
<tr>
<td>110(30%)</td>
<td>83(30%)</td>
</tr>
</tbody>
</table>
3.4 Tools

The selection of a tool for a particular research study depends on various considerations, such as objectives of the study, amount of time disposal of the investigator, availability of a suitable tool, personal competency of the researcher to administer them etc.

Keeping in mind all those things, the following tools were developed and standardized accordingly for the present study.

3.4.1 Questionnaire

Questionnaire is a sort of tool consists of a series of questions about different dimensions given to an individual or group with an aim to gather data about a problem under investigation. The researcher uses questionnaire where number of questions under various dimensions are included as per the objectives and needs of the study.

A questionnaire was developed by the investigator for measuring the perception of college students towards computer education. It was developed in
such a manner that students did not find any difficulty to respond and could respond in free and frank manner. Thus, it was developed and was made reliable and valid depending upon field testing and taking opinions from the guide and experts.

As per the needs of the present study, several questions concerning the perception of students towards computer education were included in the questionnaire. In the first page of the questionnaire, guidelines for students to fill up the statements of the questionnaire along with the personal information were included. The students were instructed to fill up the questionnaire with due care and assured that the responses were sought for research purpose only and would not be disclosed.

Before finalizing it, a pilot study was conducted on sample of students of the same nature of the present study. In the initial stage, the questionnaire contained 45 questions including both closed and open forms. In order to test the content validity of the questions included in the questionnaire, it was applied on 130 college students before final execution. Then after getting the responses from that group, the tool was given to the guide and experts and on the basis of the suggestions; modifications were done and the final form of the questionnaire was evolved. The tryout and discussions helped the investigator to wipe out some deficiencies, ambiguities, inadequacies etc of the questions of the questionnaire. The final form of the questionnaire was prepared with 29 closed and open type items. The closed type items could be answered either ‘Yes’ or ‘No’. Again, the open ended items had multiple responses and respondents had to choose one response among them. For
the convenience of analysis, the raw scores were converted into Z-scores and accordingly levels of perception were determined.

3.4.1. Scoring procedure of the questionnaire

A manual scoring key was prepared for scoring the questionnaire. The scoring of each response sheet was calculated. The maximum score obtained was 25 and the minimum score was 6. For giving response against ‘Yes’ 1 mark was given and for response against ‘No’, zero (0) mark was given. For assigning the levels of perception (extremely high, high, above average, average or moderate, below average, low and extremely low), raw score were converted into z-scores. On the basis of that, the assignment of the levels of perception against the range of z-scores was presented in Table 6.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Range of z-scores</th>
<th>Level of perception</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+2.01 to above</td>
<td>Extremely high</td>
</tr>
<tr>
<td>2</td>
<td>+1.26 to +2.00</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>+0.51 to +1.25</td>
<td>Above average</td>
</tr>
<tr>
<td>4</td>
<td>-.50 to+.50</td>
<td>Average</td>
</tr>
<tr>
<td>5</td>
<td>-0.51 to -1.25</td>
<td>Below average</td>
</tr>
<tr>
<td>6</td>
<td>-1.26 to -2.00</td>
<td>Low</td>
</tr>
<tr>
<td>7</td>
<td>-2.01 and below</td>
<td>Extremely Low</td>
</tr>
</tbody>
</table>

Split-half reliability was employed for determining the reliability of the questionnaire. The scores of odd and even items were separately taken on a sample
of 130 students of the pilot test. The product moment co-efficient of correlation was computed and found to be 0.81.

3.4.2 Attitude scale

In measuring complex and abstract concepts like attitude, one often finds problems of validity, reliability etc. In such situations, one uses some procedures that help to measure such dimensions properly, attitude scale is used. So, attitude scale is the some total of some procedures of assigning numbers to various degrees or levels of attitude. It can be defined as a continuum, having the highest point and the lowest point as well as some intermediate points between the two extremes. Some of the main bases for assigning procedures of attitude scales are subject orientation, response form, degree of subjectivity, scale properties, number of dimensions, techniques of scale construction etc.

3.4.2.1 Selection of items for the attitude scale

The researcher conducted the present study with a view to know the attitude of college students towards computer education. Though a number of readymade standardized tolls were available, but those tools were found suitable mainly for school students. Another most important thing was that most of the scales were suitable to test students’ computer attitude and not the attitude towards computer education. In selecting the items as well as the weightage to be included in the scale were sought by taking the suggestions of the guide as well as the experts in the field of research, education and teaching. In this way, as per the suggestions, the
coverage of the contents, language, item nature etc were determined and the researcher made modifications wherever necessary.

3.4.2. ii Try out of the scale and item analysis

For analyzing the items, the scale was made ready for try out after finalizing the administrative instructions and proper scoring procedures. For that, in the initial stage, it consisted of 70 statements having equal numbers of positive and negative statements. It was first administered on a sample of 130 college students of same nature with the students selected for the present study in order to test the content validity of the items included in the scale. In the first page of the scale, guidelines for students to fill up the statements of the scale along with the personal information were included. The students were instructed to fill up the statements with due care and assured that the responses were sought for research purpose only and would not be disclosed.

The preliminary form of the scale was constructed by following Likert’s method of scale construction having five (5) alternative responses namely ‘Strongly agree’ (SA), ‘Agree’ (A), ‘Undecided’ (U), ‘Disagree’ (D) and ‘Strongly disagree’ (SD). The respondents had to decide the answers to every statement and put a tick mark (√) in the appropriate box against each alternative response. No time limit was fixed to fill up the statements of the scale.

In case of the positive statements, scoring weightage were ranged as 5, 4, 3, 2 and 1 against ‘Strongly Agree’, ‘Agree’, Undecided’, ‘Disagree’ and ‘Strongly Disagree’ respectively. Likewise, in case of the negative statements, the scoring
weightage were just reversing the way adopted for the positive statements. For scoring of the items of the scale, raw scores were converted into Z-scores.

3.4.2. iii The final form of the attitude scale

On the basis of the results of the try out, a panel of experts including the guide and others having teaching and research experiences were consulted and thus the final form of the scale was prepared with 41 statements having 21 positive and 20 negative statements. The try out was helpful for deleting the statements having same nature, confusing to be answered, irrelevant with the objectives of the study etc. Moreover, for the final form of the scale, the language and sentence structure of many statements were re-arranged.

3.4.2. iv Scoring procedure of the attitude scale

A manual scoring key was prepared for scoring the attitude scale. The scoring of each response sheet was calculated. The maximum score obtained was 164 and the minimum score was 108. The scoring weightage of the attitude scale were presented in Table 7.

Table 7
Scoring weightage of the attitude scale

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Type of statement</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Strongly agree</td>
</tr>
<tr>
<td>1</td>
<td>Positive</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Negative</td>
<td>1</td>
</tr>
</tbody>
</table>
Again, for interpretation of the levels of attitude of students, raw scores were converted into Z-scores and accordingly attitude levels (positive and negative) were determined which was done keeping in view of convenience of interpretation and that procedure was made similar to the procedure adopted in scoring the items of the try-out attitude scale.

The assignment of attitude levels in the attitude scale was as follows showed in Table 8.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Range of z-scores</th>
<th>Attitude level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+.22 to +2.60</td>
<td>Positive</td>
</tr>
<tr>
<td>2</td>
<td>-.08 to -4.53</td>
<td>Negative</td>
</tr>
</tbody>
</table>

3.4.2. v Reliability of the scale

The reliability co-efficient of the attitude scale was calculated with the help of Split-half method. It was done by correlating the scores on the statements having odd numbers with those of the even and it was found to be 0.92. Also Test-retest technique was used as another method for determining reliability, which was found to be 0.86.

3. 5 Data collection procedures

Data is the main element of any research process. The data used in a research work are mainly of two types- primary data and secondary data. For collecting primary data for this study, the investigator visited each of the sample colleges of Nagaon district.
The investigator approached the Principals of the respective colleges with a permission letter approved by the guide in order to meet the students. Then the teacher of the concerned computer education department/centre of every college was consulted to know the students’ strength and other related matters of the study.

After knowing the students’ strength, the investigator met the students and let the students know the purpose of the meeting. Students were given instructions regarding the procedures to fill up the tools. Students were also assured that it was not a test and so there would be no question of right or wrong responses. The investigator collected the response sheets for research purpose and nothing else. Additionally, students were assured that the responses would not be revealed and would remain confidential.

After collecting the filled up tools, the investigator thanked the students for the co-operation. In this way, the investigator collected the data from 10 colleges for the study. As the required number of sample students was not found at one visit, so the investigator had to visit the same college for a couple of days.

3. 6 Collection of secondary data for the present study

This study mainly made use of primary data. But, in order to enrich the knowledge acquired from primary sources and verifying the data, secondary data were used. With a view to collect such data, the investigator visited the different libraries and institutions within and outside the state and those were as follows,

-K.K. Handiqui Library, Gauhati University, Assam.
The investigator went through various secondary sources like books, M. Phil dissertations, PhD thesis, synopsis, national and international research journals, newspapers, census reports, web pages etc to collect data. Moreover, in order to collect materials internets as well as various educational websites were also visited.

3. 7 Statistical techniques used for data analysis

The filled up forms of the questionnaire and the attitude scale were collected from the respondents and scored according to the instructions of the test manuals. As per the norms given in the test manuals, every student’s score was calculated and the levels of perception and attitude were determined. The raw scores were converted into Z-scores to tabulate the attitude levels and levels of perception. Students’ scores were also categorized on the basis of gender (male, female) and locality of institutions (rural, urban). Thus, to realize the inferences, the collected data were tabulated. With the application of some statistical techniques, the inferences were drawn.

In the present study, both descriptive and inferential statistics were used for data analysis. Those were as follows.
-Simple frequency percentage.

-Measure of central tendency (Arithmetic Mean).

-Standard deviation

-T-test.

These statistical techniques were used in the following ways.

1. Simple frequency percentage was calculated to show the levels of perception and attitude of students.

2. Measure of central tendency (Arithmetic Mean) was calculated for the level of perception as well as attitude groups of male-female and rural-urban students.

3. Measures of Variability (Standard Deviation) was calculated regarding level of perception as well as attitude groups of male-female and rural-urban students.

4. T-test was used to show the difference in the levels of perception between male and female as well as rural and urban students.

5. T-test was also used to show the difference in attitude between students of rural colleges and students of urban colleges and difference in attitude between male and female students.

Graphical representations of data were also done for showing the data pictorially by using Bar-diagram.