CHAPTER - III
METHODOLOGY
CHAPTER - III

3. METHODOLOGY

3.1. INTRODUCTION:

The previous chapter (Chapter-II) was concerned with the review of related literature which helped in defining the present study and its methodology. In the present chapter, the methodology has been presented under titles; viz. need of the study, statement the problem, definition of terms, objectives of study, hypotheses, delimitations of the study, sample, tools, data collection, analysis and interpretation of data and scheme of chapterisation. Each of these are discussed in what follows:

3.2. NEED OF THE STUDY:

Technical education is one of the most significant component of human resource development spectrum with great potential for contributing to the national economy and for improving the quality of life of the people. Development of technical education for women has, therefore, been a deliberate policy of the Government of India, since Independence. It hardly needs any further emphasis that the access to technical education needs to be improved to optimise their participation in the mainstream of the technical work force and to contribute to the industrial economy of the nation. Girls as well as women should receive not as good, varied and comprehensive a general education as boys and men, but also suitable professional and technical education such as would fully equip them for their duties both in the home as well as outside. The destiny of a nation is moulded and fashioned through its educational process and in this the technical education for women has a strategic importance.

In Assam, the scenario in the field of technical education for women is not at all satisfactory. A large gap exists between males and females in the utilisation of provisions of technical education. Most women go for arts and commerce courses, few go for technical courses. In recognition of the importance of technical education, successive Five Year Plans laid great emphasis on the development and consolidation of technical education, in terms of both quality and quantity, in the State, due to which some improvement have been achieved, but it cannot be claimed to be substantial enough.
In recognition of the importance of technical education for women in Assam, the investigator felt the need to take up this particular study. The investigator felt that the problems faced by the girl students in the technical institutions of Assam need proper investigation. As the investigator belongs to the State of Assam, she, therefore, has particular interest in studying the problems of the girl students in the technical institutions of Assam. It will be worthwhile to make a critical appreciation of the nature and magnitude of the problems of these girls and to find out reasons for their low participation in technical education in the State. It will be equally interesting to find out the reasons and circumstances under which these problems arise. So far no research in this area (as proposed here) has been taken up in the State of Assam. It is thereby hoped that this study will be able to draw a true picture of the problems faced by the girl students in the technical institutions of Assam and to put forward some recommendations for their effective solution.

3.3. **STATEMENT OF THE PROBLEM**

The main aim of the present investigation is to study the technical education of girls in the State of Assam. It aims to study and analyze the problems faced by the girl students in the technical institutions of Assam. It also takes into account the development of technical education in Assam and also tries to identify factors which facilitate or hinder participation of girls in technical education in the State of Assam. It also tries to suggest some remedial measures for solving the problems of the girls students in the technical institutions of Assam. The aim of the present investigation is also to study the attitude of the girl students in the technical institutions of Assam towards technical education.

The present investigation, therefore, aims at studying the technical education of girls in the State of Assam with all its related aspects. So the problem has been formulated for the study under the following title:

"A STUDY OF THE GIRL STUDENTS IN THE TECHNICAL INSTITUTIONS OF ASSAM WITH SPECIAL REFERENCE TO THEIR PROBLEMS".

3.4. **DEFINITION OF TERMS**

The terms has been defined according to some well-known Dictionaries.
TECHNICAL :

According to the Webster's New International Dictionary, the term technical means - of or pertaining to the useful or mechanic arts, or any science, business, profession, sport or the like; especially appropriate to any art, science, business or the like; as technical training, problems, skills, words.

The Oxford English Dictionary defines technical as - of or in a particular art, science, handicraft, etc; Technical terms, skill, difficulty; of, for in applied science or vocational training, Technical College, education, school - dealing with applied Science.

The Penguin Modern English Dictionary defines technical as - by or for industrial and mechanical arts and skills, peculiar to some specific branch of knowledge, art, industry, etc; precisely accurate in description; not understandable by laymen; college institution, teaching engineering and other technical skills.

According to the Chamber's Twentieth Century Dictionary, technical means - pertaining to art, especially, a useful art or applied science; industrial; belonging to, or in the language of, a particular art, department of knowledge or skill, profession; so called in strict legal or technical language.

INSTITUTION :

The Webster's New International Dictionary defines institution as - an established society or corporation; an establishment, one of a public character, a foundation; as a literary or charitable institution, also a building or buildings occupied or used by such organisation.

According to the Oxford English Dictionary, institution means - an establishment, organisation or association, instituted for the promotion of some object, one of public utility, religious, charitable, educational etc. the name is often popularly applied to the building appropriate to the work of a benevolent or educational institution.

Institution, according to the Penguin Modern English Dictionary means - a act of instituting; that which is instituted; established society or organisation, headquarter
of this; house, school, hospital, etc, run by such a society or by public authorities, well-known and long established custom, rule, practice, etc.

According to the Chamber's Twentieth Century Dictionary, institution implies - the act of instituting or establishing; that which is instituted or established, foundation; established order; enactment; a society or organisation established for some object especially, cultural, charitable, or beneficent, or the building housing it.

**Girl** - The Webster's New International Dictionary defines girl as - a female child; a maiden, also a young unmarried women; a girl bachelor; being a young female.

According to the Oxford English Dictionary, girl means - a female child; applied to all young unmarried women.

The Penguin Modern English Dictionary defines girl as - a female child, young unmarried women.

According to the Chamber's Twentieth Century Dictionary, girl means - a female child; a young unmarried women; a women irrespective of age.

**Student** - According to the Webster's New International Dictionary the term student implies - a person engaged in study; one devoted to learning; a learner, a scholar, one who attends a school, or who seeks knowledge from teachers or books.

The Oxford English Dictionary defines student as - a person studying in order to qualify himself for some occupation; or devoting himself to some branch of learning or investigation, or observation, or under instruction at university or other place of higher education or technical training.

The term student, according to the Penguin Modern English Dictionary means - one engaged in study; at a College, university or other place of instruction; studious person; one receiving an annual grant of study.

According to the Chamber's Twentieth Century Dictionary, student means - one who studies, one devoted to books or any study; one who is enrolled for a course of instruction in a College or University; an undergraduate.
PROBLEM:

According to the Chamber's Twentieth Century Dictionary the meaning of problem is - a matter difficult of settlement; or solution; a question or puzzle propounded for solution.

According to the Dictionary of Education, technical education means - education in vocational or technical subjects provided in a secondary school or further educational institution.

The Dictionary of Education defined institute as - institute refers to an educational or research establishment or university.

Keeping in view with the definition of the terms used in the study, the following objectives are set for the present investigation.

3.5. OBJECTIVES OF THE STUDY:

1) To study the development of technical education in Assam since Independence with special reference to girls' participation.

2) To identify factors which help or hinder participation of girls in technical education in the State of Assam.

3) To investigate the problems faced by the girl students in the technical institutions of Assam.

4) To suggest remedial measures for solving the problems of girl students in the technical institutions of Assam.

5) To study the attitude of girls studying in the technical institutions of Assam towards technical education.

3.6. HYPOTHESES:

On the basis of the objectives of the Study, certain hypotheses has been put forward by the investigator. The hypotheses are the following:
1) Development of technical education in Assam since Independence has been satisfactory.

2) Certain factors help or hinder participation of girls in technical education in the State of Assam.

3) The girl students in the technical institutions of Assam face some problems.

4) The attitude of girls studying in the technical institutions of Assam towards technical education is favourable.

5) Certain remedial measures may be suggested for solving the problems of girl students in the technical institutions of Assam.

3.7. **DELIMITATIONS OF THE STUDY** :

1) The study is confined only to the technical institutions of Assam.

2) The study is confined only to the girl students of the technical institutions of Assam.

3) The study takes into account the teachers and administrators of the concerned institutions only.

3.8. **SAMPLE** :

The population for the present study comprised of girl students and teachers from the 2 Engineering Colleges, 1 Regional Engineering College at Silchar, 7 Co-educational Polytechnics and 2 Girls' Polytechnics.

The sample selected for the study included a random selection of 270 girl students and 60 teachers. 12 Principals of the technical institutions of Assam were also interviewed personally by the investigator.

The following distribution will give the total picture of the sample with regard to Questionnaire for girl students and the Attitude Scale.
<table>
<thead>
<tr>
<th>NAME OF THE INSTITUTIONS</th>
<th>NUMBER OF GIRL STUDENTS PRESENT IN THE INSTITUTION</th>
<th>SAMPLE TAKEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assam Engineering College, Guwahati</td>
<td>138</td>
<td>40</td>
</tr>
<tr>
<td>Jorhat Engineering College, Jorhat.</td>
<td>77</td>
<td>30</td>
</tr>
<tr>
<td>Regional Engineering College, Silchar.</td>
<td>87</td>
<td>30</td>
</tr>
<tr>
<td>Girls' Polytechnic, Guwahati.</td>
<td>88</td>
<td>54</td>
</tr>
<tr>
<td>Residential Girls' Polytechnic, Golaghat.</td>
<td>52</td>
<td>41</td>
</tr>
<tr>
<td>P.O.W. Institute of Engineering and Technology, Jorhat.</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Dibrugarh Polytechnic, Dibrugarh.</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Nowgong Polytechnic, Nagaon.</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Silchar Polytechnic, Silchar.</td>
<td>24</td>
<td>8</td>
</tr>
<tr>
<td>Assam Engineering Institute, Guwahati.</td>
<td>51</td>
<td>20</td>
</tr>
<tr>
<td>Assam Textile Institute, Guwahati.</td>
<td>19</td>
<td>16</td>
</tr>
<tr>
<td>Bongaigaon Polytechnic, Bongaigaon.</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>600</strong></td>
<td><strong>270</strong></td>
</tr>
</tbody>
</table>
Sixty teachers of the twelve technical institutions of Assam including Heads of the Departments, Professors and Lecturers responded to the questionnaire administered to them.

ASSAM A PROFILE:

The science of history was unknown to the early inhabitants of Assam, and it was only from the Ahom invasion in 1228 A.D. that anything at all approaching a connected account of the people and their rulers can be obtained. For several hundred years previously some scattered facts may be collected from a few ancient inscriptions and from observations of a Chinese traveller. Before that nothing definite is known, and our information consists of some dubious and fragmentary references in the Mahabharata, the Puranas and Tantras and other similar records.

Ancient Assam, known as Progjyotishpur or 'Kamrupa' in the great epics, the Ramayana and Mahabharata, and in other principal Puranas, occupied an area larger than that of the Modern Assam State and extended westward towards the river Karatoya. The Kingdom comprised the whole of Brahmaputra valley, together with Rangpur and Cooch Bihar. The Kingdom included Manipur, Jainta, Cachar, and other parts of Mymensingha and Sylhet (now in Bangladesh).

Assam, known as Kamrupa in ancient times, has a glorious ancient heritage. She has a history going back several centuries before the Christian era. The history is full of historic deeds done by valiant kings and generals and great humanitarian works done by well known saints and seers. Bhagadutta, Kumar Bhaskar Barman, Lachit Borphukan, Sri Harshadev Barman, Sri Sankardev, Sri Madhabdeb are amongst the many historic names that adorned the pages of history. Though united with the rest of India at all times culturally and geographically, politically Assam was an independent state till the advent of the British Power in 1826, when the six hundred years old rule of the Ahoms came to an end. Assam was thus one of the latest victims of British imperialism in India, but it is gratifying to note that she was also one of the earliest to rise in national self consciousness forging ahead her destiny in resurgent India.

Assam is the frontier province of India on the North-East. It extends from latitude 22°.19' to 26°.16' N and longitude 89°.42' 96°.30'E. It is located between
the foothills of the eastern Himalayas and the Patkai and the Naga ranges, covering roughly a triangular area of 1,219,973 sq. On the sides of the province is shut in by the great mountain ranges, inhabited by people mostly of Mongolian stock. To the north lie the Himalayan regions of Bhutan and Tibet. Below the high mountains is a range of sub-Himalayan Hills, inhabited by small races of Bhutia origin, and further eastward by Tibeto-Burman tribes, Akas, Daflas, Miris, Abors, and Mishimis. To the north-east lie the Mishimi hills curving round the head of the Brahmaputra Valley. Continuing to east is the patkai range being chiefly inhabited by the speakers of the Indo-Chinese language of the Mon-Khamer group.

The modern name of the province, Assam is of recent origin. It is connected with the "Shan" invaders who entered the Brahmaputra Valley in the beginning of the thirteenth century A.D. and who were known as Ahoms. The tradition of the Ahoms, therefore is the present name derived from Assam, in the sense of "unequalled" or "peerless". With the Assamese prefix it would mean "undefeated", "Conquerors". The name of "Assam" was applied to the country by the Muslim chroniclers after the name of the ruling people, the Ahoms.

Assam is divided physically into two pain parts, the highlands of the frontier tracts to the north and east, and the plains below. The plain consists of the two river valleys, the Brahmaputra valley and the Surma Valley. Between the valleys lie the broken hills of Assam range comprising Garo, Khasi, Jaintia Hills, North Cachar Hills, Karbi Anglong hills and Naga Hills. The plain comprises the present districts of Bongaigaon, Dhemaji, Goalpara, Dhubri, Kokrajhar, Barpeta, Nalbari, Kamrup, Darrang, Nagaon, Morigaon, Sonitpur, Jorhat, Golaghat, Sibsagar, Dibrugarh, Tinsukia, Lakhimpur, Karimganj, Hailakandi, and Cachar. The hilly region comprises the Districts of Garo Hills, united Khasi and Jainta Hills, Karbi Anglong, North Cachar, Mizo Hills, and Naga hills. But except Karbi Anglong and North Cachar Hills Districts, the other hills district have been separated from Assam identifying different names. The united Khasi and Jainta and Garo hills forming a new state Meghalaya, Mizo hills as Mizoram and Naga Hills takes the name of Nagaland. The Alluvial plains of Assam consists of (a) the valley of Brahmaputra and its tributaries and (b) the Surma valley. The Brahmaputra and its tributaries cover approximately an area of 56,274 sq. Kms, while Surma valley forming a triangle south of the Shillong plateau, is bounded on the east by the Mizo hills and on the south by the hills of Tripura.
Through the heart of the province runs the mighty river Brahmaputra or Lauhitya, extending from eastern part of Assam to the west covering a distance of 724 kms. It is the chief artery and highway of Assam. For generations the Assamese have watered their fields with its life-giving floods and drunk its blessed water; their whole history and culture are intimately connected with the Brahmaputra.

Assam is rich in fauna and flora. Assam is famous for the one horned rhino. Its luxious forests and scenic beauty charms everybody. Agriculture is the main occupation of the people.

Assam is thus an Anthropological museum with varied socio-religious systems, and at different stages her history has been closely linked with India on one side, as on the other with south-east Asia and the pacific world. Assamese culture is the sum total of primitive and advanced contributions by the Austric, Alpine - Aryan, and Tibeto - Burman elements. Beginning with the pre-historic period, the land has been exposed to invasion from all directions, but with the dawn of history, her links became closer, both politically and culturally with the rest of India.

Dispur (Guwahati) is the present capital of the State. Assam with an area of 78, 438 sq. kms, has a population of 22, 294 562 (according to 1991 Census). Assam has kept intact its tradition of a higher percentage of literacy than the national level. According to the census of 1991, the literacy rate for the State of Assam is 53.42%. While 62.34% of males are literate, women literacy stands at 43.70%. Through the literacy rate of Assam is slightly higher than the all - India average (1.31% better than All - India percentage) it has not been very much satisfactory because Assam ranks 22nd amongst states in order of literacy. Female literacy in Assam is higher than All - India percentage. It is 4.28% better than All India percentage.

In Assam, the scenarios in the field of technical education is not satisfactory. There are 3 Engineering College, 1 I I T, and 9 Polytechnics in the State. Out of 9 Polytechnics, 2 are exclusively for girls and the rest are co-educational Polytechnics. Against the background of 50 percent of the population being women, the percentage of girls joining the technical courses is too poor. A large gap exists between males and females in the utilisation of provisions of technical education.
Brief description of the technical institutions of Assam are furnished below:

**Engineering Colleges:**

There are two State Government Engineering Colleges in Assam. These are the Assam Engineering College, Guwahati and Jorhat Engineering College, Jorhat. Medium of instruction in both the Colleges is English. Both these Colleges are fully residential. However, the respective Principals, if satisfied may allow a student to stay outside the campus.

1) **Assam Engineering College, Guwahati**: The Assam Engineering College was established in 1955 and is situated at Jalukbri, at a distance of about 12 Km. on the west from the heart of Guwahati City/Railway Station and about 13 Km. from Guwahati Airport. The College is affiliated to Gauhati University.

2) **Jorhat Engineering College, Jorhat**: The Jorhat Engineering College was established in 1960 and is located at a distance of 3 K.M. on the east of Jorhat Town/Railway Station and 8 Km. to the east of Jorhat Airport. The College is affiliated to Dibrugarh University.

3) **Regional Engineering College, Silchar**: There is a Regional Engineering College at Meherpur, (Silchar), which was established in 1967. The Silchar Regional Engineering College had an annual intake capacity of 250 students, in the conventional branches of engineering studies. For admission in the different Regional Engineering Colleges of India, the admission rules of the respective institutions will be applicable.

A joint Admission Test is held for admission into the two Engineering Colleges and Regional Engineering Colleges of India (for Assam quota only).

**POLYTECHNICS:**

The Polytechnics provide facilities for study in Diploma and Certificate courses in Engineering and Technology after H.S.L.C. (10 +). The main objective of the Polytechnic courses of studies is to produce technicians at supervisory level to meet the demand of technical manpower in various fields of development.
A view of Silchar Polytechnic, Silchar.

Girl Students of Assam Engineering College, Jalukbari (Guwahati) in their classroom.
Students of Girls' Polytechnic, Guwahati.

A view of Assam Textile Institute, Guwahati.
Students of Residential Girls' Polytechnic, Golaghat in their uniforms.

A view of P.O.W. Institute of Engineering and Technology, Jorhat.
Girl Students of Regional Engineering College, Silchar.

A view of Nowgong Polytechnic, Nagaon.
At present there are altogether nine State Polytechnics in Assam under the administrative and supervisory control of the Director of Technical Education, Assam.

1) **H.R.H. the Prince of Wales Institute of Engineering and Technology, Jorhat**: H.R.H. The Prince of Wales Institute of Engineering and Technology was established in 1927 at Jorhat. It is situated 2 Kms. away from the heart of Jorhat Town/Railway Station and 6 Kms. away from the Jorhat Airport.

2) **Assam Textile Institute, Guwahati**: The Assam Textile Institute was established in 1920 at Ambarni, Guwahati. It is located 2 Kms. away from the heart of the Guwahati City/Railway station and 24 kms. away from the Guwahati Airport.

   Formerly the Assam Textile Institute was under the Directorate of Industries but it was declared as a Polytechnic in 1973 under the Directorate of Technical Education, Assam.

3) **Assam Engineering Institute, Guwahati**: The Assam Engineering Institute was established in 1948 at Chandmari, Guwahati. It is located 4 Kms. away from the heart of the Guwahati City/Railway Station and 26 Kms. away from the Guwahati Airport.

4) **Silchar Polytechnic, Meherpur**: The Silchar Polytechnic was established in 1960 at Meherpur, Silchar. It is located at a distance of 4 Kms. away from the heart of the Silchar town and 5 kms. away from Railway Station. It is situated 20 Kms. away from the nearest Airport.

5) **Nowgong Polytechnic, Nagaon**: The Nowgong Polytechnic was established in 1961 at Nagaon. It is located 3 Kms. away from heart of the Nagaon town, 7 Kms. away from the nearest Railway Station and 114 Kms. away from the nearest Airport.

6) **Girls' Polytechnic, Guwahati**: The Girls' Polytechnic was established in 1964 at Bamunimaidan, Guwahati. It is located 5 Kms. away from the heart of the Guwahati City/Railway Station and 27 Kms. away from the nearest Airport. This institution is exclusively meant for girls.
7) **Dibrugarh Polytechnic, Lahowal**: The Dibrugarh Polytechnic was established in 1965 at Lahowal, Dibrugarh. It is located at a distance of 11 Kms. away from heart of the Dibrugarh Town/Railway Station and 16 Kms. away from the nearest Airport.

8) **Bongaigaon Polytechnic, Bongaigaon**: The Bongaigaon Polytechnic was established in 1986 at Bongaigaon. It is located at a distance of 7 Kms. away from the heart of the Bongaigaon Town/Railway Station and 210 Kms. away from the nearest Airport.

9) **Residential Girls' Polytechnic, Golaghat**: The Residential Girls' Polytechnic was established in 1987 at Pulibor, Golaghat. It is located at a distance of 3 Kms. from the heart of the Golaghat Town and 54 Kms. away from the nearest Airport. This institution is exclusively for girls.

The Polytechnics of Assam are affiliated to the State Council for Technical Education, Assam. The State Council for Technical Education, Assam is a Council of Members appointed by the Government of Assam to advise the Government in all matters relating to Technical Education in the State. The Examination Committee of the State Council is responsible for conducting the Post-Diploma, Diploma and Certificate Examinations in different disciplines of Engineering and Technology offered by the Polytechnics.

The Diploma courses offered by the Polytechnics, affiliated to the State Council for Technical Education, Assam, have all been recognised by the Government of India and the Diploma holders are reorganised for the purposes of recruitment to all subordinate posts and services under the Central Government in appropriate fields.

The same recognition is maintained by the State Government of Assam and other states of the country for the purpose of recruitment to similar subordinate posts and services. The different courses available at the Polytechnics are job-oriented, as well as, they are oriented for self employment. All the Diploma and post Diploma Courses conducted in the State Government Polytechnics are approved by the AICTE.
THE INDIAN INSTITUTE OF TECHNOLOGY (I.I.T.), NORTH GUWAHATI:

The 6th I.I.T. was established in September, in 1994 at North Guwahati. The I.I.T.s acts as a centres of advanced learning imparting training to both under-graduate and post-graduate students. Their objective is to improve the quality of technical education within the country, by undertaking, to develop the faculty of other engineering and technology institutions. The I.I.T.'s are autonomous with freedom to formulate their own academic programmes and confer degrees, diplomas and other academic awards of their own. These are wholly financed by the Central Government.

The construction of the I.I.T. at North Guwahati has not been completed. Hence, classes are temporarily being held at the Institution of Engineers, Panbazar, Guwahati.

For the last two years, no girl student has been admitted due to lack of accommodation.

3.9. TOOLS:

The selection of tools for a particular study depends upon various considerations, such as the objectives of the study, the amount of time at the disposal of the investigator, availability of the suitable tools and the personal competency of the investigator to administer them.

On the basis of these criteria two sets of Questionnaires were developed by the investigator. One for the students at Appendix I and another for the teachers at Appendix II. The questionnaires are to meet the demands of the objectives 2,3 and 4 which pertain to the collection of information needed by the investigator and so the questionnaires are designed on the basis of the investigated problem.

An Attitude Scale was constructed on the pattern of Likert's Five-point scale for measuring attitude to meet the demands of objective No. - 5.

An Interview Schedule was also prepared and administered on the Principals of the technical institutions of Assam.
Necessary literature pertaining to technical education were collected from different sources. Then they were studied in detail to have a thorough knowledge about technical education.

DEVELOPMENT OF QUESTIONNAIRES:

Necessary literature pertaining to technical education were collected from different libraries of the technical institutions and from the library of the Gauhati University. They were studied in detail to have a thorough knowledge of technical education. In the second step, a survey in the Girls' Polytechnic, Guwahati was conducted wherein, the staff and students were interviewed and they provided ideas to the investigator to develop the questionnaires. At the time of interviewing, an attempt was made to check whether response of the interviews were in accordance with the literature from the respective faculties. Thus, the Interview Schedule as a tool was prepared to aid the authenticity of the information collected. Next step was the construction and organisation of the questionnaires. According to the need of the study several items concerning technical education and its related aspect were constructed. Before evolving a final form of the questionnaires, the tool was given to experts consisting of the heads of the departments, professors, lecturers and students of the Girls' Polytechnic, Guwahati. On the basis of their suggestions, modifications were made to evolve the final version of the questionnaires. Then the questionnaires were tried out on a small group of students and teachers in the Girls' Polytechnic, Guwahati. The try-out enabled the investigator to discover some deficiencies, omissions, ambiguities and inadequacies in the items. The final form of both the questionnaires contain closed and open type questions. Thus, the two questionnaires were prepared with a view to fulfil the comprehensive coverage of various aspects of technical education and clear-cut directions were given to the respondents to respond to the questionnaires. Also, covering letters requesting the respondents to express their reactions were addressed to each respondent.

Thus, after conducting a pilot study and careful consideration of other factors, the questionnaires were finalised.
DEVELOPMENT OF THE ATTITUDE SCALE:

As mentioned earlier the fifth objective of the study was to study the attitude of students towards technical education. For this purpose a scale was devised as no standardised tool was available to study the attitude of the students towards technical education. A summated rating scale (Likert type) was developed by the investigator. In the summated rating scale comparison of attitude scores of two or more groups can be done.

The investigator developed the attitude scale according to the following steps which are usually taken to construct a Likert type of scale.

1) Collection of a large number of positive and negative statements regarding the attitude towards the psychological object under consideration.

2) Selection of approximately equal number of positive and negative statements.

3) Administration of these items to a number of individuals asking them to indicate their opinions regarding each statement by determining whether they strongly agree, agree, undecided, disagree and strongly disagree.

4) Computation of the scores of each individual using the scoring procedure.

5) Carrying out an item-analysis to select items that yield the best discrimination. Through item-analysis one finds the correlation between the subject's total scores and their responses to each item. The investigator collected various statements representing the different aspects of technical education from discussions, dissertations, books, journals and newspapers. The statements were sorted out with the help of the experienced teachers and students and 60 statements were considered to be relevant to measure the attitudes towards technical education. While choosing and formulating the statements, due importance was given to the technique of scale construction and the different aspects of technical education. The statements were worded carefully by taking necessary precautions about the clarity, brevity, and simplicity of language, and the equal number of positive and negative statements. The statements were administered on a small group of students of the Girls' Polytechnic, Guwahati. On the basis of their reactions and opinions, the statements were found to be highly discriminative. Care was also taken to avoid the ambiguity in the statements and to keep the procedure of criteria.
of internal consistency. Each of the selected items were arranged on a five-point scale such as strongly agree, agree, undecided, disagree and strongly disagree. Finally 30 statements were selected for the scale. The selected 30 statements contain approximately an equal number of positive and negative statements. The validity of the tool was established on the basis of the experts' opinion. The split-half reliability of the instrument was 0.96, which was established on a small group of students of the Girls' Polytechnic, Guwahati.

3.10. **DATA COLLECTION**

The investigator went personally to each of the technical institutions of Assam for the collection of data. In each of the technical institutions the tools were administered according to the organisational facilities extended by the institutions. Data were collected between the months of January to May, 1997. Simultaneously, personal unstructured interviews with teachers and students were also conducted.

3.11. **ANALYSIS AND INTERPRETATION OF DATA**

Keeping in view, the objectives of the study, the data collected were classified and tabulated. Measures were taken to present the data through qualitative and quantitative analysis. Attempts were also made to use simple appropriate statistics like percentages and rank method.

The total data has been classified into 3 parts:

1) Responses to the questionnaires from the girl students.
2) Responses to the questionnaires from the teachers.
3) Responses to the Attitude Scale.

**ANALYSIS AND INTERPRETATION OF THE QUESTIONNAIRES**

The questionnaires both for students and teachers were analysed questionwise.
The students' questionnaires were analysed as a single category titled 'Students', irrespective of their different classes and branches. The questionnaires were analysed first in terms of frequencies and then converted into percentages for which qualitative analyses has been made. There were some questions which consisted of two parts. The part one was of Yes/No type of question, the second part was either an open ended question or at times even a closed question. While analysing the second part of the question, the responses to the first part was taken as the basis. With regards to a few questions the ranks have been awarded on the basis of the frequencies. There were also few open-ended questions, to which the students could answer freely.

The teacher's questionnaires were analysed as a single category titled 'Teachers', irrespective of whether they were heads of the departments, professors or lecturers. The questionnaires were analysed first in terms of frequencies and then converted into percentages for which qualitative analysis has been made. There were some questions which consisted of two parts. The part one was of Yes/No type of question, the second part was either an open ended question or at times even a closed question. While analysing the second part of the question, the responses to the first part was taken as the basis. With regard to a few questions the ranks have been awarded on the basis of the frequencies.

Thus, both the questionnaires were analysed and interpreted according to the need of the second, third and fourth objectives.

**ANALYSIS AND INTERPRETATION OF THE ATTITUDE SCALE**

On the basis of the demand of the fifth objective of the study the total data for attitude scale were analysed and interpreted.

The Attitude Scale was composed of 30 positive and negative statements regarding technical education. In responding to the items on this scale, the subjects indicate whether they strongly agree, agree, undecided, disagree and strongly disagree with each statement. The numerical value assigned to each response depends on the degree of agreement or disagreement with individual statements. Here the scoring of a respondent is determined by means of summing up the values assigned to individual responses. Each attitude score is itself a score value on the psychological continuum on which the statements has been scaled. In scaling the statements one end of the
continuum has been defined as unfavourable and the other as favourable, with the middle category as "neutral". For example, if a subject obtains 30 marks on a 30 items - Summated rating scale, this score could be interpreted as unfavourable attitude whereas 150 will be favourable because, the attitude represents a strong agreement to positive statements. The neutral point would be 90 as it is the mid-point of the possible range of scores.

In the present study, the scoring procedure was done in accordance with Likert's method by assigning weights of 5, 4, 3, 2, and 1 for positive statement and 1, 2, 3, 4, and 5 reversed scoring procedure for the negative statements. Therefore, measurement on the present attitude scale was:

\[
\begin{align*}
30 \times 5 & = 150 \text{ favourable.} \\
30 \times 3 & = 90 \text{ neutral.} \\
30 \times 1 & = 30 \text{ unfavourable.}
\end{align*}
\]

Analysis has been done for the data under the following heads:

1) Attitude of the girl students in total towards technical education.

2) Attitude of the girl students of the co-educational technical institutions and girls' technical institutions towards technical education.

3) Difference in attitude towards technical education among the students of the co-educational technical institutions and the girls' technical institutions of Assam.
3.12. **SCHEME OF CHAPTERISATION**:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>I</td>
<td>Introduction</td>
</tr>
<tr>
<td>Chapter</td>
<td>II</td>
<td>Review of Related Literature</td>
</tr>
<tr>
<td>Chapter</td>
<td>III</td>
<td>Methodology</td>
</tr>
<tr>
<td>Chapter</td>
<td>IV</td>
<td>Analysis and Interpretation of Data</td>
</tr>
<tr>
<td>Chapter</td>
<td>V</td>
<td>Summary, Findings and Conclusion</td>
</tr>
<tr>
<td>Chapter</td>
<td>VI</td>
<td>Suggestions for further research in this particular area</td>
</tr>
</tbody>
</table>

The Bibliography is then provided. In the Appendices, tools of the study, have been included.

Method, sample, tools and techniques are the important components of any research work. The investigator used the survey method for her descriptive type of research. 270 girl students and 60 teachers from the technical institutions of Assam were selected for the study. In total two sets of Questionnaires, one Attitude Scale and one Interview Schedule were used in this research.

The next Chapter "Analysis and Interpretation of Data" presents an analysis and interpretation of the entire data collected during the period of investigation.