CHAPTER – III

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CHAPTER III

METHODOLOGY

3.1 INTRODUCTION

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. The scope of research methodology is wider than that of research methods. Thus, when we talk of research methodology we not only talk of research methods but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method as technique and why we are not using other so that research results are capable of being evaluated either by the researcher himself or by others (Kothari, 2004).

3.2 STATEMENT OF THE PROBLEM

It is imperative to study about the effectiveness of any programme of the universities so as to improve its strengths and to limit the limitations. It is very important to assess the effectiveness of the programme in the case of open universities, since it is learnt by the learners of the university without any contact directly with the teaching community. Moreover the assessment of the effectiveness of the programme is useful to improve the resources for the benefit of learners.

The purpose of any training programme such as B.Ed is fulfilled only when it gets benefited by the prospective teachers. Without the satisfaction of learners and improvement of their teaching competency through undergoing the training programme, a programme cannot be useful for the society of the country. The quality
of the programme can be assessed either directly by evaluating the quality or by assessing the competency of the trainees who have undergone the training programme. In this context, it is mandatory to assess the level of professional as well as academic capabilities of the prospective teachers of the university. The researcher assumes that the quality of the IGNOU B.Ed programme can also be studied through assessing the professional and academic competency of its learners. Hence the researcher has undertaken the problem for the study and is stated as: “AN ASSESSMENT OF THE EFFICACY OF IGNOU B.Ed PROGRAMME IN THE CONTEXT OF THE ACADEMIC AND PROFESSIONAL PERFORMANCE OF TEACHER TRAINEES”

3.3 HYPOTHESES FORMULATED FOR THE STUDY

1. The IGNOU B.Ed programme is distinct and has high potential for imparting academic and professional qualities and values in teacher trainees.

2. There is maximum transfer of the academic and professional skills and qualities developed during the training period, to the actual classroom situation.

3. There is significant positive correlation between multimedia usage and academic performance of distance learners.

4. Significant differences exist among distance learners in their usage of multimedia learning facilities on the basis of their background variables.

5. The teacher trainees in the IGNOU B.Ed programme experience difficulties in accessing and practicing the activities envisaged in the programme.
3.4 OBJECTIVES OF THE STUDY

1. To find the curricular potential of the IGNOU B.Ed programme for imparting quality teacher education;

2. To find out the general nature of attitude of teacher trainees towards the IGNOU B.Ed programme;

3. To find the extent of use of activities in the IGNOU B.ED programme for improving the academic performance of teacher trainees;

4. To find the extent of use of activities in the IGNOU B.Ed programme for professional development of teacher trainees;

5. To identify the teacher efficacy of teacher trainees of IGNOU B.Ed programme;

6. To find out the difficulties being encountered by teacher trainees while engaging in the activities of the IGNOU B.Ed programme; and

7. To identify measures to enhance the availability, accessibility, and create the academic and professional aspects of the IGNOU B.Ed programme to the teacher trainees on the basis of the findings of the research.

3.5 METHODOLOGY

3.5.1 Method Adopted for the Study

The survey approach to educational problems is one of the most commonly used approaches. It goes beyond mere gathering and tabulating of data. It involves interpretations, comparison, measurement, classification, evaluation and generalization of all directed towards a proper understanding and solution of significant educational problems (Sharma, 2004). It brings into the focus the existing educational problems and also suggests way of meeting them.
Method of research used in the present investigation is survey to collect data from the selected sample to analyze them to arrive at meaningful findings.

3.5.2 Variables of the Study

This section deals with the variables involved in the present analysis. Major variables of the present study are Quality of Curriculum as perceived by student teachers, Attitude towards IGNOU B.Ed programme, Multimedia Usage and Teacher Efficacy of student teachers’ of Indira Gandhi National Open University (IGNOU).

The background variables used in the study are: Gender (Male / Female), Age (below 25 / 25 – 45 / above 45), Locality (Rural / Urban), Years of Teaching Experience (below 5 years / 5 – 10 years / above 10 years), Subject (Arts / Science / Language) and Nature of Service (Government / Aided / Unaided).

3.5.3 Population

The aggregate or totality of objects or individuals regarding which conclusions are to be drawn is known as the population. A population is any group of individuals who have one or more characteristics in common that are of interest to the researcher. The population may be all the individuals of the particular type or a more restricted part of that group (Kothari, 2004).

The population of the present investigation comprises of the student teachers those who are doing their B.Ed programme in Indira Gandhi National Open University, New Delhi through distance mode and working as a teacher in a school.
3.5.4 Sample

Sample is a small proportion of a population selected for observation and analysis. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it is drawn (Best, 2006).

The sample of the present investigation comprises of 480 student teachers doing their B.Ed programme in Indira Gandhi National Open University, New Delhi, covering all the groups selected randomly from various programme study centres of IGNOU in Kanyakumari District of Tamilnadu and Kollam District of Kerala. A Table showing the number of sample selected from various study centres of Kanyakumari District of Tamilnadu and Kollam District of Kerala is given as Appendix I.

3.5.4.1 Sampling Procedure

The sampling technique adopted in the present study is random sampling. A prior planning was made by the researcher with his guide to choose proper strata of students from the population in a random manner.

3.5.4.2 Distribution of Sample

Distribution of sample was done according to the various background variables and sub categories. The sample was collected in such a way that an adequate proportion of the sample was included in each categories of the variable and the important categories were presented in the following Table:
<table>
<thead>
<tr>
<th>Variable</th>
<th>Sub-Category</th>
<th>Male</th>
<th>Female</th>
<th>No.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td>116</td>
<td>364</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>98</td>
<td>264</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Below 5 yrs</td>
<td>192</td>
<td>288</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 5-10 yrs</td>
<td>52</td>
<td>264</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 10 yrs</td>
<td>52</td>
<td>264</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>Locality</td>
<td></td>
<td>288</td>
<td>288</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>356</td>
<td>356</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>192</td>
<td>192</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>Subject</td>
<td></td>
<td>88</td>
<td>143</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Arts</td>
<td>88</td>
<td>143</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>249</td>
<td>249</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Language</td>
<td>249</td>
<td>249</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>Years of Teaching Experience</td>
<td></td>
<td>118</td>
<td>118</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Below 5 yrs</td>
<td>98</td>
<td>98</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-10 yrs</td>
<td>264</td>
<td>264</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 10 yrs</td>
<td>264</td>
<td>264</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>Nature of Service</td>
<td></td>
<td>192</td>
<td>192</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aided</td>
<td>313</td>
<td>313</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unaided</td>
<td>87</td>
<td>87</td>
<td>480</td>
<td></td>
</tr>
<tr>
<td>Table 3.1 Distribution of Sample</td>
<td></td>
<td>116</td>
<td>364</td>
<td>480</td>
<td></td>
</tr>
</tbody>
</table>
3.5.5 Tools and Techniques Used for the Study

The researcher has used the following tools to collect data to arrive at meaningful findings:

i. Quality of Curriculum Scale

ii. Attitude towards IGNOU B.Ed programme Scale

iii. Multimedia Usage Scale

iv. Teacher Efficacy Scale

v. Interviews with experts and persons associated with Programme Study Centres of IGNOU regarding the feasibility of the B.Ed Programme

3.5.5.1 QUALITY OF CURRICULUM SCALE (QCS)

The researcher has taken Quality of Curriculum of B.Ed Programme conducted by IGNOU as the focus of the study to find out the status of the quality existing as perceived by the student teachers undergoing B.Ed programme in the university concerned.

Quality of any curriculum often varies as perceived by the student community which imbibes them from the university and influenced by various characteristics such as the psychological characteristics as well as the environment in which the course provided. Therefore the researcher has perused the literature available on characteristics of effective curriculum given by various experts related to teacher education in order to choose research instrument for assessing the quality of IGNOU B.Ed programme. But as there is no specialized tool available in the market to assess the quality of B.Ed programme as perceived by student teachers, the researcher has worked out a strategy to develop a valid tool for assessing the quality of B.Ed programme as perceived by its student teachers.

Identification of Dimensions
The quality of B.Ed programme of any university depends upon the expectation of its student teachers as well as the way it has been implemented to the student teachers. The qualities of an effective curriculum of teachers’ education are a composite of many characteristics which may be picked out from the research findings reported in journals. Therefore the researcher has perused different websites having publication of Journals and Dissertation Abstracts in an international level, to gather information about the qualities of an effective curriculum. After going through a vast literature the researcher has identified four major dimensions pertaining to the quality of the curriculum.

**Dimension 1 – Information or Content:** Important characteristics of the quality of any curriculum are the relevancy of the information or content given in the curriculum. It is the core of the curriculum which has to be learnt by its learners; hence it affects the entire community by making proper behaviour modifications among the student teachers of the community. Therefore the researcher has treated this as the dimension one, of quality of curriculum.

**Dimension 2 – Strategy of Implementations:** The nature of the curriculum can be highly affected by the way used to implement the curricular aspect to the learner community. The methods of implementation provided by the authority concerned or the strategy utilized by the faculty members of the course concerned or programme, can be highly affected the quality of the curriculum. Especially when the quality of the curriculum is described on the basis of the perception of student teachers concerned, then the way of transaction of the curriculum gets much important to be considered / assessed. Hence it is taken as dimension number two.

**Dimensions 3 – Evaluation:** Evaluation is a structured process of assessing the success of a project in meeting its goals and to reflect on the lessons learned. Evaluation is a
systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards. It can assist an organization to assess any aim, realizable concept or proposal, or any alternative, to help in decision-making; or to ascertain the degree of achievement or value in regard to the aim and objectives and results of any such action that has been undertaken. The way of assessment of the performances of the learners of the concerned programme is also equally important to improve the quality of the curriculum. The way of assessment strategies or evaluation criteria practiced by the examination authority will definitely be a factor influencing the quality of the curriculum. Hence it is taken as dimension three.

**Dimension 4 - Teacher Behaviour:** The quality of the curriculum not only affected by the above said factors, another important factor influencing may be the behaviour of teacher in the classroom while transacting the curriculum. Everything exhibited by the teacher within the classroom related to teaching can affect the intensity of the curriculum. It includes the methods of teaching strategies used in teaching process and the techniques followed in the classroom in classroom management, etc. An effective teacher can make a poor curriculum into effective and vice versa to the perception of the learners. Hence it is treated as the fourth dimension.

**Preparation of Items**

After identifying the dimensions and their respective characteristics involving the quality of the curriculum the researcher has prepared items for each one of them with the help of published journals and books and the assistance of the guide. The first draft of the tool consists of 35 items which include items from various dimensions as information or content – 19, strategy of implementation – 8, Evaluation – 5, teacher behaviour – 3. The first draft of the quality of curriculum scale is given in the Appendix II.
Establishing Validity

Validity of the tool is said to be the quality of a data gathering instrument or procedure that enables it to measure what it is supposed to measure. To establish the validity of the quality of curriculum scale prepared by the researcher with the assistance of the guide, following strategies were adopted:

➢ Content Validity

To establish content validity, the tool was given to the experts in education and psychology and the guide to test the appropriateness of the items that have included under the various areas of the selected variable. As per the suggestions and corrections given by the experts, modifications were done in the required items. The assessment of the experts authenticated that the items of the scale were directly related to the quality of the curriculum of B.Ed programme as perceived by student teachers. Thus the content validity of the tool was established.

➢ Pilot Study

To establish the validity and reliability of the tool the draft tool had been taken multiple copies and administered to 100 student teachers.

➢ Item Validity

To establish the item validity of the prepared tool, the researcher took multiple copies of the tool and administered among hundred student teachers randomly taken from various programme study centres of IGNOU from Kanyakumari District of Tamilnadu. After administration the researcher scored the responses and collected the data for each items, dimension and completed tool. Then the researcher computed item – dimension
correlation for each item to establish the validity of each one. Then the researcher computed item composite score correlation. The data are furnished in the given Appendix III.

The item which secures greater than $r$ value = 0.30 were retained for the final draft of the tool whereas the remaining items were discarded. Thus the final draft tool consists of 31 statements and is given as Appendix IV.

**Table 3.2**

*Items of Quality of Curriculum Scale*

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimension</th>
<th>Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Information or Content</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15</td>
</tr>
<tr>
<td>2.</td>
<td>Strategy of Implementation</td>
<td>16, 17, 18, 19, 20, 21, 22, 23</td>
</tr>
<tr>
<td>3.</td>
<td>Evaluation</td>
<td>24, 25, 26, 27, 28</td>
</tr>
<tr>
<td>4.</td>
<td>Teacher Behaviour</td>
<td>29, 30, 31</td>
</tr>
</tbody>
</table>

**Scoring Procedure**

The fifteen items in the beginning of the tool has three options such as highly satisfied, moderately satisfied, and not satisfied. The remaining item in this tool is rated on a five point scale. The options given to every statement are Excellent, Adequate, Good, Satisfactory and Poor. The respondents were asked to respond to the extent of their acceptance of the statements. The scoring is done as given in the Table below:
Table 3.3
Scoring Scheme of Items in the Quality of Curriculum Scale

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Response</th>
<th>Scores of Positive Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Highly Satisfied</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Moderately Satisfied</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Not Satisfied</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3.4
Scoring Scheme of Items in the Quality of Curriculum Scale

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Response</th>
<th>Scores of Positive Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Excellent</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Adequate</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Good</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Satisfactory</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>Poor</td>
<td>1</td>
</tr>
</tbody>
</table>

3.5.5.2 ATTITUDE TOWARDS IGNOU B.ED PROGRAMME SCALE (AIBPS)

In the present investigation, to assess the attitude of student teachers towards IGNOU B.Ed programme, the researcher has prepared a tool titled, ‘Attitude towards IGNOU B.Ed Programme Scale’ which is also validated by the investigator.

Preparation of the Draft Tool

After the perusal of literature and few available tools of attitude towards various programmes of other samples, the researcher had identified the different areas of attitude
towards a IGNOU B.Ed programme of student teachers. In the light of the review and discussions with the guide the researcher framed different areas of student teachers attitude towards IGNOU B.Ed programme such as to attitude towards the course, course materials, facilities available, knowledge development, etc. After identifying the components for each one of the major aspects, the researcher has prepared statements based on each component to be included as the test items in the proposed tool and prepared 22 items for the first draft of the tool. It is given in the Appendix V.

**Establishing Validity**

The following strategies have adopted for establishing validity of the tool:

➢ **Content Validity**

The process of validation started with phase I of establishing content validity. Copies of the draft tools were provided to three experts guiding doctoral studies in education in different universities with a request to study the appropriateness of the statements prepared and offer suggestions for better alternations and modification. Based on the suggestions given by the experts the draft tool was recast. Hence the prepared tool has got content validity.

➢ **Pilot Study**

To establish the validity and reliability of the tool the draft tool had been taken multiple copies and administered to 100 student teachers.

➢ **Item Validity**

After content validity of the tool was established, the tool was administered with 100 student teachers undergoing their B.Ed programme in IGNOU through various
programme study centres in Kanyakumari district to establish the item validity of the tool. The administered tools were collected and the scores were used to compute item total correlation. The items which secured the correlation coefficient value above 0.30 were retained in the tool. The final tool consists of 22 items. The correlation and coefficient values for the items are given in the Appendix VI.

**Scoring Procedure**

Each item in this tool was rated on a three point scale. The options were Agree, Undecided and Disagree. The respondents were asked to select the options given to the extent of the acceptance of the given items. The scorings of the items are given in the Table below. For negative items, the score has to be used in reverse. The final draft of the tool is given in the Appendix VII.

**Table 3.5**

*Scoring Scheme of Items in the Attitude towards IGNOU B.Ed Programme Scale*

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Response</th>
<th>Scores of Positive Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Agree</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Undecided</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Disagree</td>
<td>1</td>
</tr>
</tbody>
</table>

**3.5.5.3 MULTIMEDIA USAGE SCALE (MUS)**

In the present investigation, to assess the usage of multimedia by the student teachers of IGNOU B.Ed programme to collect academic and non academic information about the course related aspects, the researcher has prepared a tool titled, ‘Multimedia Usage Scale’ which is also validated by the researcher.
**Preparation of the Draft Tool**

At beginning, the researcher has searched for some of the existing scales of multimedia usage by student teachers. Though the number of tools is available for multimedia usage and knowledge no scale is available exclusively for assessing the multimedia availability of student teachers. Thus the researcher has gone through various existing scales of multimedia usage to get the basic idea to prepare a new scale for the same. Then the researcher has reviewed various related literature regarding the concept of multimedia and its usage in teacher education programmes, especially in distance mode of education. In the light of the review and discussion with the guide the researcher has framed two dimensions namely usage of multimedia for academic purpose, multimedia usage for non-academic purpose and prepared 13 and 7 items respectively. Thus the first draft of the tool consists of 20 items under the above said dimensions and the first draft of the tool is given in the Appendix VIII.

**Establishing Validity**

The following strategies have been adopted for establishing validity of the tool:

➢ **Content Validity**

To establish content validity, the tool was given to the experts in the field of education as well as to psychologist who had the teaching experience of at least 10 years at different levels of education and to the guide. As per the suggestions and corrections given by the experts, modifications were adopted in the required items. The assessment of the experts authenticated that the items of the scale were directly related to the concept of multimedia usage of student teachers. Thus the content validity of the tool was established.
Pilot Study

The prepared research tool was taken multiple copies, and administered among 100 student teachers to establish the validity and reliability of the tools.

Item Validity

After content validity of the tool was established, the tools were administered with 100 student teachers from various programme study centres of IGNOU in Kanyakumari district to establish the item validity of the tool.

The administered tools were collected and the scores were used to compute item – dimension – total correlation. The items which secured the correlation coefficient value above 0.30 were retained in the tool and remaining items were deleted from the tool. After the deletion of the items the final tool consists of 18 items. The correlation and coefficient values for the items and dimensions are given in the Appendix IX.

The final draft of the tool is given in the Appendix X. The distribution of the items of the final draft of multimedia usage of student teachers of IGNOU under the selected dimensions is as follows:

Table 3.6

Items of Multimedia Usage Scale

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dimension</th>
<th>Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Academic Purpose</td>
<td>1,2,3,4,5,6,7,8,9,10,16</td>
</tr>
<tr>
<td>2.</td>
<td>Non Academic Purpose</td>
<td>11, 12, 13, 14, 15, 17, 18</td>
</tr>
</tbody>
</table>
Scoring Procedure

Each item in this tool is rated on a five point scale. The options are Always, Often, Occasionally, Rarely and Never. The respondents were asked to tick any one of the options to the extent of the acceptance of the given items. The scorings of the items are given in the Table below. For negative items, the score has to be used in reverse.

Table 3.7

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Response</th>
<th>Scores of Positive Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Always</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Often</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Occasionally</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Rarely</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>Never</td>
<td>1</td>
</tr>
</tbody>
</table>

3.5.5.4 TEACHER EFFICACY SCALE (TES)

The tool used for the present study is a questionnaire for measuring teacher efficacy developed by Guskey & Passaro (1994) modified into a scale and is given in the Appendix XI. The items on this form assess two efficacy dimensions indicated with ‘I’ (Internal) and these items of teachers perceptions of their personal influence is teaching and learning situations. Item numbers 1, 7, 8, 11, 12, 14, 15, 16, 18 and 19 assess this dimension. The second efficacy dimension assesses teachers’ perceptions of the influence of external factors indicated with ‘E’, (External) factors that lie outside of their direct control. The external items all relate to the negative influence of external factors. Item numbers 2, 3, 4, 5, 6, 9, 10, 13, 17, 20 and 21 are related to this aspect. Because these two
efficacy dimensions operate fairly independently, they are best reported separately rather than combined as a single efficacy score is given as Appendix XII. The scale format makes a statement with which respondents can Strongly Agree, Agree and Disagree. The scores assigned are in the order 3, 2 and 1 for positive items and 1, 2, and 3 for negative items respectively. The final tool is given as Appendix XIII.

3.5.6 Procedure of Data Collection

Collection of data from the selected sample is done by the following procedures:

3.5.6.1 Administration of the Tools

The four research tools namely QCS, AIBPS, MUS and TES and the Personal data sheet as Appendix XIV, were administered to 480 student teachers undergoing their B.Ed programme in Indira Gandhi National Open University, New Delhi through the programme study centres in Kanyakumari District of Tamilnadu and Kollam District of Kerala, after the prior permission from the principals and programme-in-charges of the institutions. The researcher explained about the tools to the individuals personally. Directions were given not to leave any question unanswered and fill the entire information completely which would be used only for the purpose of research and kept confidential. The individuals were requested to answer all the statements and return them promptly to the researcher.

3.5.6.2 Scoring

After collecting the required number of tools from various strata of sample, the responses to each of the items were evaluated and scores were given as per the key. Total score was calculated for all the scales. All the background information collected was coded into arithmetic values and to be used for the analysis and interpretation of data.

3.5.6.3 Tabulation
A master Table was drawn with adequate columns and rows to enter the data that was collected from the individuals with the help of research tools administered by the researcher.

3.5.7 Statistical Techniques Used

Following are the statistical techniques that are used in the present research for the purpose of analysis of data:

* Apart from Arithmetic Mean and Standard Deviation, ‘t’ test for independent and large sample was used to find out the significant differences between two means. Critical ratio is identified using the formula

\[
C. R = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}
\]

(Sharma, 2007)

Where

\[
M_1 = \text{Mean of the First Group}
\]
\[
M_2 = \text{Mean of the Second Group}
\]
\[
\sigma_1 = \text{Standard Deviation of the First Group}
\]
\[
\sigma_2 = \text{Standard Deviation of the Second Group}
\]
\[
N_1 = \text{Size of the First Group}
\]
\[
N_2 = \text{Size of the Second Group}
\]

* ANOVA was used to find out the difference among more than two means

\[
F \text{ ratio } = \frac{MS_b}{MS_w} = \frac{SS_b/df_b}{SS_w/df_b}
\]

(Best, 2006)

Where

\[
MS_b = \text{Mean square between groups}
\]
\[
MS_w = \text{Mean square within groups}
\]
\[
SS_b = \text{Sum of squares between}
\]
\[ SS_w = \text{Sum of squares within} \]
\[ df_b = \text{Degrees of freedom of between groups} \]
\[ df_w = \text{Degrees of freedom within groups} \]

* Post ANOVA Test (Scheffe) was used to find out the significant difference between means when the F score is significant

\[ F_{cv} = (k - 1) F_{\alpha} (k - 1, df_w) \]

Where

\[ k = \text{The number of groups} \]
\[ (k-1) = \text{The degrees of freedom} \]
\[ df_w = \text{Overall ANOVA summary (Mean Squares Within)} \]
\[ F_{\alpha} = \text{Critical value of F test} \]

* Carl Pearson’s Product Moment Correlation was used to find out the relationship between two variables

\[ r = \]

(\textit{Ghosh, 1992})

Where

\[ N = \text{Total number of pairs} \]
\[ x, y = \text{Raw scores} \]
\[ r = \text{Carl Pearson’ product moment correlation co-efficient} \]

* Regression Analysis was used to find out the predicting nature of independent variables on the dependent variable
Regression Equation \( y = a + bx \)

Slope \( b = \frac{(N \Sigma XY - (\Sigma X)(\Sigma Y))}{(N \Sigma X^2 - (\Sigma X)^2)} \)

Intercept \( a = \frac{(\Sigma Y - b(\Sigma X))}{N} \)

Where

\( x \) and \( y \) are the variables

\( b \) = The slope of the regression line

\( a \) = The intercept point of the regression line and the y axis.

\( N \) = Number of values or elements

\( X \) = First Score

\( Y \) = Second Score

\( \Sigma XY \) = Sum of the product of first and Second Scores

\( \Sigma X \) = Sum of First Scores

\( \Sigma Y \) = Sum of Second Scores

\( \Sigma X^2 \) = Sum of square First Scores

3.6 CONCLUSION

The researcher has presented this present chapter with the caption of methodology which included all the areas related to the method and procedure of the research. The chapter begins with the introduction and prolongs with the statement of the problem, objectives and hypotheses, population, sample, sampling techniques, tools used and its descriptions, statistical techniques, etc. This chapter tends to give an outline of the research procedure which is the basic part of any research work.

*The next chapter deals with Analysis and Interpretation of Data.*