CHAPTER – IV
METHOD AND PROCEDURE

In the preceding chapters – we have stated the objectives of the present study and have also reviewed related research studies and their designs. The purpose of this chapter is to select the most appropriate method and techniques to solve the particular problem under investigation. It is a crucial step in research because, if a wrong decision is made, the whole study may be fruitless on the ground of inappropriate design or ever worse as being unscientific or illogical. As a matter of fact no one readymade design can solve all the problems. The nature of the problem determines which design and procedures are most appropriate and how they should be tailored for the study. The description of the research method and procedures used in the present study is presented under following heads:

4.1 Method of the Study
4.2 Population of the Study
4.3 Sampling
4.4 Size of the Sample
4.5 Sample of the Study
4.6 Variables Involved
4.7 Tools Used
4.8 Administration of the Tools
4.9 Statistical Techniques Used
4.1 METHOD OF THE STUDY:

In order to achieve the objectives of the study "Ex-post Facto Research Method" was used. The choice of this method was mainly governed by its intrinsic value in comparing study groups with regard to their characteristics and in ascertaining the multivariate relationships between the various sets of variables involved in the study. Survey studies are conducted to collect detailed description of existing phenomena with the intent of employing data to justify current conditions and practices or to make more intelligent plans for improving them. Therefore the researcher feels it appropriate to use "Causal Comparative Method or Ex-Post Facto Research Method" of research in this study.

An Ex-post Facto Research is that empirical investigation in which the investigator draws the inference regarding the relationship between variables on the basis of such independent variables whose manifestations have already occurred. In this type of research the investigator has no direct control over the independent variable because they occur much prior to producing their effects.

4.2 POPULATION OF THE STUDY:

The population for the present study has been defined as the higher secondary students studying in class XI of the U.P. Board schools of Meerut district. There are about 133 intermediate colleges in this district. Hence, the findings of our study will apply to the above
mentioned population only.

3.3 SAMPLING:

The first consideration before the investigator was to select the institutions for the purpose of the study. To select the institutions simple random sampling was used. These are about 133 U.P. board intermediate colleges for boys and girls situated in Meerut district. Out of these 20 institutions were selected randomly. The list of selected institutions is given below:

List of the Selected Institutions is given below:

**FOR BOYS**

1. N.A.S. Inter College, Meerut  
2. C.A.B. Inter College, Sadar, Meerut  
3. D.N. Inter College, Meerut  
4. Govt. Inter College, Meerut  
5. National Inter College, Meerut  
6. Ram Sahay Inter College, Meerut  
7. St. Joseph Inter College, Meerut  
8. S.S.D. Inter College, Meerut  
9. K.K. Inter College, Meerut  
10. S.S.D. Boys Inter College, Lalkurti, Meerut

**FOR GIRLS**

1. Durgabadi A.B. Girls Inter College, Meerut  
2. R.G. Girls Inter College, Meerut
3. Ismail Girls Inter College, Shastri Nagar, Meerut  
4. S.S.D. Girls Inter College, Lalkurti Meerut  
5. S.S.D. Girls Inter College, Budhana Gate Meerut  
6. Kanohar Lal Girls Inter College, Meerut  
7. Arya Girls Inter College, Meerut  
8. S.D. Girls Inter College, Meerut  
9. St. Thomas Girls Inter College, Meerut  
10. Khalsa Girls Inter College, Thapar Nagar Meerut

Having selected the institutions randomly all the higher secondary students were included in sample through simple random sampling through lottery system.

The next important step was to establish rapport with the principals of each of these above institutions, they were first contacted through a personal letter addressed to them by the investigator and subsequently the investigator personally went to each of the above institutions to have a contact with their principals. They were explained the significance and the purpose of study and their co-operation for a successful conduct of the study. Each one of the principals was highly co-operative and extended his co-operation willingly.

**4.4 SIZE OF THE SAMPLE:**

Since the size of the sample should be large enough to surve an adequate representation of the population about which the researcher wished to generalize her findings and small enough to be selected economically in terms of availability expense in terms of both time
and money and complexity of the data analysis.

Manifest Anxiety scale, self-concept inventory and level of aspiration measure tests were administrated on the 500 male and female students of class XIth in each section of arts and science streams of the above mentioned institutions. About 216 male and 201 female students of art and science students of class XIth took these tests in these institutions. Some of them have not filled the test papers properly. Hence only answer sheets of 417 students were scored with the help of the scoring keys included in their manuals. The following tables show the total number of male and female higher secondary students of arts and science streams.

4.5 SAMPLE OF THE STUDY:

Table – 1

Showing the Total Number of male and female students of Class XIth

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Sex of Student</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Male</td>
<td>216</td>
</tr>
<tr>
<td>2.</td>
<td>Female</td>
<td>201</td>
</tr>
</tbody>
</table>

Table 1 shows the number of male and female students of class XIth who were selected in our sample used for the purpose of this study. This table shows the number of male and female student was 216 and 201 respectively.
4.6 VARIABLES INVOLVED:

(a) Independent Variables

(i) Anxiety

(ii) Self-concept

(iii) Level of Aspiration

(b) Dependent Variables

(i) Academic Achievement

4.7 TOOLS USED:

The present investigation aimed at studying the Multivariate analysis of anxiety. Self-concept and level of aspiration with academic achievement of higher secondary students. The characteristics to be probed, therefore, were anxiety, self-concept and level of aspiration and academic achievement. To measure each one of these variables the following tools; all of which being highly reliable and valid, have been employed.

Following tools was used for Ratio collected.

Table – 2

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Variables</th>
<th>Name of Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Academic Achievement</td>
<td>Final Examination Records of High School U.P. Board</td>
</tr>
<tr>
<td>2.</td>
<td>Anxiety</td>
<td>Manifest Anxiety Scale prepared by Dr. S.C. Joshi</td>
</tr>
</tbody>
</table>
A detailed account of the tools used in this study has been presented in the following description.

**ACADEMIC ACHIEVEMENT:**

Finding out dependable and reliable criterion of academic achievement has been puzzling problem for every researcher in such problems. Reliable and valid tests in different subjects which are taught at high school level are not available. Moreover, facilities were not available for administration of too many tests, nor the principals and students would have agreed to spare so much of their time for that purpose. Hence, it was decided to use the total marks obtained by each one of the students on the courses offered by him at high school level in the final examination held in 2009.

**ANXIETY**

The anxiety was measured by Dr. Suresh Joshi's Manifest Anxiety Scale. The investigator developed Manifest Anxiety Scale (MAS) to measure anxieties of adolescent students. The inventory measures five major aspects of one's anxiety namely:

1. Examination and academic abilities
2. Class room interactions

3. Peer group Relations

4. Family Support

5. Moral standards of Behaviour

The selected statements and their area wise figures were put under the following table:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Area of Anxieties</th>
<th>Total Number of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Examination and academic abilities</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Class room interactions</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>Peer group Relations</td>
<td>10</td>
</tr>
<tr>
<td>4.</td>
<td>Family Support</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>Moral Standards of behaviour</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
</tr>
</tbody>
</table>

**Scoring of the Scale:**

The scoring procedure of each item was following:

**Measuring Value:**

- More Anxiety 3
- Less Anxiety 2
- No Anxiety 1
Validity:

The correlation between scores of the different areas of Anxiety and total scores of Anxiety were completed. The value of correlations are given in the following table.

Table – 4

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Area</th>
<th>Total Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Examination and academic abilities</td>
<td>.431</td>
</tr>
<tr>
<td>2.</td>
<td>Class room interactions</td>
<td>.527</td>
</tr>
<tr>
<td>3.</td>
<td>Peer group Relations</td>
<td>.418</td>
</tr>
<tr>
<td>4.</td>
<td>Family Support</td>
<td>.384</td>
</tr>
<tr>
<td>5.</td>
<td>Moral Standards of behaviour</td>
<td>.601</td>
</tr>
</tbody>
</table>

All values are significant at .01 level.

Reliability of Manifest Anxiety Scale:

A test is reliable to the extent that it measures accurately and consistently from one time to another. A test score is called reliable when we have reasons for believe the score to be stable and trustworthy. For calculating reliability coefficients of the test, the researcher had decided to use split half or odd-even techniques to measure reliabilities of the tool, the test was administered on 400 students of class XI and XII. The raw scores obtained were than converted into standard scores. Two sets of odd and even numbered
statements and their set of standard scores were correlated using product moment method of correlation. The reliability for each test was obtained by employing Spearman Brows formula.

\[ R = \frac{2r_{12}}{1 + r_{12}} \]

The reliability results are given in the table 5.

**Table – 5**

**Split half reliability coefficient of Manifest Anxiety Scale**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Area</th>
<th>Split half Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Examination and academic abilities</td>
<td>.831</td>
</tr>
<tr>
<td>2.</td>
<td>Class room interactions</td>
<td>.713</td>
</tr>
<tr>
<td>3.</td>
<td>Peer group Relations</td>
<td>.693</td>
</tr>
<tr>
<td>4.</td>
<td>Family Support</td>
<td>.677</td>
</tr>
<tr>
<td>5.</td>
<td>Moral Standards of behaviour</td>
<td>.733</td>
</tr>
<tr>
<td>6.</td>
<td>Total Anxiety</td>
<td>.711</td>
</tr>
</tbody>
</table>

Significance at .01 level

**SELF-CONCEPT INVENTORY:**

The self-concept was measured by Dr. Mukta Rani Rastogi self-concept scale. The inventory is intended to measure the impression the students have about themselves. Each behaviour of an individual, simple and complex, is influenced by how he sees himself. It we want to understand personality of an individual, to understand and predict
his life adjustment and his success and failure, we cannot proceed further without knowing this self-concept.

A variety of methods and techniques have been developed to Index self-concept. Few important techniques among these are Q-sort semantic differential technique, other types of rating methods, questionnaire and adjective checklists.

**Dimension of Self-concept and their items:**

**Table – 6**

**Constructs of self-concept along with their item numbers**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Area</th>
<th>Total Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>health and Sex Appropriateness</td>
<td>6, 20, 29, 22, 34 &amp; 46 P P N N P P</td>
</tr>
<tr>
<td>2.</td>
<td>Abilities</td>
<td>4, 8, 12, 23, 36, 88, 39, &amp; 42 P P N N P N N P</td>
</tr>
<tr>
<td>3.</td>
<td>Self-concept</td>
<td>7, 9, 14, 16, &amp; 44 P P N N P</td>
</tr>
<tr>
<td>4.</td>
<td>Self-acceptance</td>
<td>2, 10, 17 &amp; 35 P N N N</td>
</tr>
<tr>
<td>5.</td>
<td>Worthiness</td>
<td>1, 3, 19, 25, 27, 41 &amp; 48 P N N P P N P</td>
</tr>
<tr>
<td>6.</td>
<td>Present, Past and Future</td>
<td>18, 22, 26, 31 &amp; 40 P P N N P</td>
</tr>
<tr>
<td>7.</td>
<td>Beliefs and Convictions</td>
<td>24, 47, 49 N P P</td>
</tr>
</tbody>
</table>
The letters 'P' or 'N' below each item show the positiveness or negativeness of the items.

**Reliability:**

Reliability of the scale by split half method following Spearman Brown Prophecy formula was found to be (.87)

**Method of Administration:**

The self-concept scale is self-administering. It can be administered individually as well as to a group. There is no time limit but all the items can be responded within the time limit but all the items can be responded within the time limit of 30 minutes. The respondent is given following instructions to give his response:

"Here are given fifty one statements. Below each statement are given five responses (Strongly agree, Agree, Undecided, Disagree and Strongly disagree) please read each statement carefully and respond to it by marking a tick on any of the five responses given."
Example: I feel shy before others.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Try to give your response according to what you feel about yourself in reference to that statement.

**Scoring Method:**

The respondent is provided with five response alternatives to give his response and therefore a score from one to five may be obtained for each item, positive item are scored five to one for responses and negative items scored one to give for the same responses alternatives.

**Norms:**

Mean scores of the ten constitute and total tests were computed separately which are given in following table.

**Table – 7**

Mean Score for the construct and the whole scale.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Constant</th>
<th>Male</th>
<th>Female</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Health and Sex appropriateness</td>
<td>21</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>2.</td>
<td>Abilities</td>
<td>29</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>3.</td>
<td>Self-confidence</td>
<td>18</td>
<td>16</td>
<td>17</td>
</tr>
</tbody>
</table>
LEVEL OF ASPIRATION:

The level of aspiration was measured by Dr. Mahesh Bhargava and Lt. Prof. M.A. Shah. Bhargava (1975) has developed a test on level of aspiration. The first page of the level of aspiration booklet contains general information of the testee instructions to the respondent and the scoring table while remaining eleven pages contains the performance sheet of this measure which are arranged in order of trail numbers.

Trial for Level of Aspiration Measure:

The performance sheet has 50 circles (9 each of 1 cm in diameters) which are arranged in five rows – ten in each row. Above and below of these rows there are two boxes on right side – the upper box is for writing the number of expected score whereas lower box is for putting the number of actual score or completed performance.
Thus ten trials are needed of each subject except practice trial. Shop watch or stop clock is also required for the rest.

**Instruction to the Respondent:**

The following instructions which are also mentioned on the first page of the booklet are to be given to the respondent before the actual work beings:

"You are going to do a simple task, you have a page containing 50 circles in front of you and you have to draw four lines in these circles, so that they may appear like a human face. You must draw the line in this sequence - Right eye, Left eye, Nose and Mouth. Work from left to right across the rows and then proceed to the next line.

For each trial 30 seconds are allotted for work and at the end of this time, you will be asked to stop the marking and count the number of completed faces and enter it in lower box. This trial will be treated as PRACTICE TRIAL". In the following trials you have to do the same thing along with to put the number of faces in the upper box which you intend to complete within 30 seconds time on the basis of last actual performance. Thus you have to complete 10 trials for actual work."

**Scoring and Interpretation:**

The procedure of scoring is simple. It provides three types of scores: (1) Goal Discrepancy Score (GDS), (2) Attainment
Discrepancy Score (ADS); and (3) The Number of Times of Goal Reach Score (NTRS).

**Goal Discrepancy Score (GDS):**

The extent and direction of the difference between actual score on the previous trial and goal set up of the next trial is known as goal discrepancy or F.D. Score, which is obtained by subtracting the actual score on a trial from the aspiration score (Goal Set up score) for the next trial. Thus in other words, goal discrepancy is the gap between aspiration for the next trial (expected score) and the immediate performance on previous trial.

A positive goal discrepancy suggests that one's goal is higher, in relation to one's previous performance and a negative goal discrepancy indicates that one's goal is lower than one's previous performance. It means if expected score on the next trial is more than the actual score on the previous trial, the GDS is termed as positive whereas if it is less than the immediate past performance the GDS will be negative.

If the differences of scores are consistently positive. It indicates that the subject seldom attains the goal he sets for himself and we might say that he or she is over aspirant expects more and does less or he may be called idealistic. If the differences of scores are consistently negative, it indicates that the subject does better than he says and we
might call him as under aspirant – does more and expects less. Goal discrepancy may also be interpreted in terms of ego-involvement.

**Reliability**

The reliability of this measure is calculated by the test-retest method and the spilt half method and is given as follows.

**Reliability of Test**

<table>
<thead>
<tr>
<th>Method</th>
<th>N</th>
<th>CDS</th>
<th>ADS</th>
<th>NTRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test - Retest Method</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With a gap of 1 month</td>
<td>100</td>
<td>.88</td>
<td>.82</td>
<td>.86</td>
</tr>
<tr>
<td>With an interval of 3 months</td>
<td>50</td>
<td>.72</td>
<td>.75</td>
<td>.74</td>
</tr>
<tr>
<td>Spilt half method</td>
<td>60</td>
<td>.77</td>
<td>.69</td>
<td>.78</td>
</tr>
</tbody>
</table>

**Validity**

It may be stated that no device or measure of level of aspiration has made any mention of validity coefficient. Perhaps the question of validity is not relevant to the study of level of aspiration. In this context, Muthayya (1959) writes, 'level of aspiration behaviour remains constant regardless of the means used to measure it'. His argument is understandable because question of validity arises when behaviour is inferred from another behaviour indirectly. In this situation, the respondent is involved in actual task proposed by him and situation is by and large realistic for him.
Still it is tried to find out the validity co-efficient with few tasks and available allied tests of aspirations and it is shown in following table.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>External Validating Criteria</th>
<th>N</th>
<th>GDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Card Sorting Tray Tasks</td>
<td>30</td>
<td>.58</td>
</tr>
<tr>
<td>2.</td>
<td>Ansari and Ansari: The L. A. Coding Test</td>
<td>60</td>
<td>.73</td>
</tr>
<tr>
<td>3.</td>
<td>V. P. Bhargava: Level of Aspiration (based on Coding Method)</td>
<td>60</td>
<td>.67</td>
</tr>
<tr>
<td>4.</td>
<td>J. S. Grewal: Occupational Aspiration Scale</td>
<td>60</td>
<td>.76</td>
</tr>
<tr>
<td>5.</td>
<td>Sharma and Gupta : Educational Aspiration Scale form V</td>
<td>60</td>
<td>.48</td>
</tr>
<tr>
<td>6.</td>
<td>Deo Mohan Projective test of Achievement motivation (n-ach) Male group</td>
<td>40</td>
<td>.72</td>
</tr>
<tr>
<td></td>
<td>Deo Mohan Projective test of Achievement motivation (n-ach) Female group</td>
<td>40</td>
<td>.78</td>
</tr>
<tr>
<td>7.</td>
<td>T.R. Sharma : Academic Achievement Motivation Test (AAMT)</td>
<td>80</td>
<td>.84</td>
</tr>
</tbody>
</table>

Since all the obtained 'r' values between the present measure of Level of aspiration and different external criteria are found significant at 0.1 level hence the test is having the satisfactory validity.
4.8 ADMINISTRATION OF THE TOOLS:

The tools mentioned earlier were administered on the sample in accordance with the procedure laid down in their respective manuals. However, before administering a test the following precautions were observed:

(i) The tests were personally administered by the investigator.

(ii) Testing was made in the rooms which were free from distracting noise.

(iii) It was ensured that each one of the testes had either a pen or pencil for making his response to the items of the test.

(iv) It was ensured that each of the respondents had filled in the required entries on the preliminary page.

(v) Instructions were read aloud in a clear and distinct voice.

(vi) If any student had any difficulty in respect of the instructions given to him or her instructions were repeated.

(vii) The students were asked not to whisper or talk or discuss with respect to any of the problems during testing period.

(viii) The tests after being completed by the test takers were personally collected by the investigator.

(ix) It was emphasized that all items have to be answered either in the positive or in the negative in 'Yes' or 'No' and that no statement must be skipped.
4.9 STATISTICAL TECHNIQUE USED:

In order to achieve the objectives of the study and for testing the hypotheses following statistical techniques were used:

To test hypotheses 1,2,3 product moment correlation was used. The Pearson product moment correlation is the statistic most commonly used to measure the degree of relationship between two variables. This correlation coefficient is symbolized by 'r' and the formula for its calculation is given below:

\[ r = \frac{N\Sigma xy - \Sigma x\Sigma y}{\sqrt{(N\Sigma x^2 - (\Sigma x)^2)(N\Sigma y^2 - (\Sigma y)^2)}} \]

Where
\[ N = \text{Number of pairs of scores} \]
\[ \Sigma x = \text{Sum of the x score} \]
\[ \Sigma y = \text{Sum of the y score} \]
\[ \Sigma x^2 = \text{Sum of the x score squared} \]
\[ \Sigma y^2 = \text{Sum of the y score squared} \]
\[ \Sigma xy = \text{Sum of the product of paired X and Y scores} \]

To test hypothesis 4 multiple regression was used. It provides us a statistical technique which describes the multivariate relationship between a dependent variable and two or more independent variable.

Thus, in three variable cases we can define following Alitken's method:
Alitken's Method of Multiple Correlation:

Alitken's method has been used for computing regression weights and for developing the regression equation. The co-efficient of multiple correlation $R_{C.123}$ is given by

$$R^2_{C.123} = b_1 r_{c1} + b_2 r_{c2} + b_3 r_{c3}$$

Where $b_1$, $b_2$ & $b_3$ are regression weights and $r_{c1}$, $r_{c2}$ & $r_{c3}$ are correlation co-efficient between criterion variable and other variables under study. The significance of $R_{C.123}$ is checked by F-test.

$$F = \frac{R^2}{1 - R^2} \times \frac{N - K - 1}{K}$$

Where 'N' is the sample size and 'K' is total number of variable.

The multiple regression equation is given by

$$X_c = b_1 \frac{\sigma_c}{\sigma_1} X_1 + b_2 \frac{\sigma_c}{\sigma_2} X_2 + b_3 \frac{\sigma_c}{\sigma_3} X_3 + A$$

Where $\sigma_c$, $\sigma_1$, $\sigma_2$ and $\sigma_3$ are standard deviation of respective variables and 'A' is a constant given by.

$$A = \bar{X}_c - b_1 \frac{\sigma_c}{\sigma_1} \bar{X}_1 - b_2 \frac{\sigma_c}{\sigma_2} \bar{X}_2 - b_3 \frac{\sigma_c}{\sigma_3} \bar{X}_3$$

Where $\bar{X}_c, \bar{X}_1, \bar{X}_2$ and $\bar{X}_3$ are mean values of respective variables.