Chapter III

Design and Methodology

- Methodology
- Population
  - Sample
- Research Tools Used
- Data Collection Procedure
- Statistical Techniques Used
Research may be defined as the systematic and objective analysis and recording of controlled observations that may lead to the development of generalizations, principles or theories resulting in prediction and possibility ultimate control of events (Best 1983). The successful execution of any activity depends on proper planning beforehand. A good research is always anchored on good planning procedure. No research can be conducted successfully without a plan of action. This chapter includes what measure is used for gathering data, how the population has been defined and sampled, what kinds of data relevant to the study are to be controlled, and what statistical techniques are to be used for data analysis. This means success of a research depends largely on the methodology followed by the investigator.

In undertaking to implement a programme or a scheme of action, one plans the overall devices to be employed, allocates the time and resources and devices about the precise treatment to be given in a specific situation. This overall structure with which implementation of a plan or programme occurs, is known as ‘design’. Thus a ‘design’ of research refers basically to the conceptual structure within which the research is conducted. It implies a plan to render the enquiry efficient so as to yield trustworthy generalizations, descriptions and predictions. The research method and procedure is the detailed plan of study. It is the detailed procedure.

In the previous chapters, the development of the problem for the present study has been traced in the light of theoretical background. The technical body of the thesis has been described in this chapter. This chapter describes design and plan of the study and highlights the details about the research procedure followed in conducting the study. It is an important part of the research study and needs to be planned and carried out systematically, to arrive at accurate result. It includes information about the population, method of selecting samples, description of research tools, data collection procedure and statistical techniques used for analysis of data.
Chapter III Design and Methodology

The design of the study was set under the following sections:

3.1 Methodology
3.2 Population
3.3 Sample
3.4 Research Tools Used:

3.4.2 Test of Study Habits and Attitudes (T.S.H.A.) by Dr. Mathur, C.P. (2002).
3.4.3 Educational Aspiration Scale (E.A.S.) Form P by Dr. Sharma, V.P. and Dr. (Km) Gupta, Anuradha (1996).
3.4.4 Examination results of the students were collected from the respective schools by the researcher to know the academic achievement of the students.

3.5 Data Collection Procedure
3.6 Statistical Techniques Used

3.1 Methodology

There are various methods of conducting research. Selection of the method depends on the nature of the problem. The present study attempts to study the ‘Personality Traits, Study Habits and Educational Aspirations of Secondary School Muslim Students in relation to their academic achievement’. This type of study cannot be studied in any laboratory setting and it is also not desirable to do so. Descriptive survey method of research was used in executing the present study, as Personality Traits, Study Habits and Educational Aspirations of Secondary School Muslim Students in relation to their academic achievement, exists in real life situation and can be studied effectively.

This method is the most popular and most widely used research method in education. According to Gay (1990, p.189), “descriptive research involves
collecting data in order to test the hypotheses or to answer the questions concerning the current status of the subject of study.” It is concerned with conditions or relationships that exist, opinions that are held, processes that are going on, effects that are evident, or trends that are developing (Best & Kahn, 1992, p.76). Survey method is an organized attempt to analyze, interpret and report the present status of a social institution, group or area. Survey studies are conducted to collect detailed description of existing phenomenon with the intent of employing data to justify current conditions and practices or to make more intelligent plans for improving them. Thus, keeping in view the objectives of the study, descriptive survey method was used.

3.2 Population

The “population” in statistics includes all members of a defined group that we are studying or collecting information on, for data driven decisions. But it is difficult to include every unit of the population for research purpose. To fulfill this purpose, we have to select a small section of the population, known as ‘sample’. Thus, before drawing a sample, the population to which it belongs, is to be defined.

In this study, secondary school level Muslim students of the Moradabad District constituted the population for the study.

3.3 Sample

A part of the population is called a sample. It is a proportion of the population, a slice of it, a part of it and all its characteristics. A sample is a scientifically drawn group that actually possesses the same characteristics as the population. The purposive sampling technique was used to draw the sample of this study. A sample of 486 secondary school Muslim male and female students was selected for the present study.

Out of 486 students, the sample comprised of 257 male and 229 female students. A group of 19 male and 12 female subjects was drawn from the Mumtaz Modern Secondary School, Ikrotia Sadat (Sambhal), 15 female
subjects from Government Girls Inter College, (Sambhal), and 35 male and 3 female subjects from Sayyed Abbas Ali Memo. Pub. School, Sarai Sadak. Another group of 30 male and 5 female subjects was drawn from Bal Vidya Mandir Inter college, Jagat; a set of 41 male and 19 female subjects was selected from the Government Inter College, Ikrotia (Sambhal) and remaining 46 female subjects was drawn from the Government Girls College Pawansa (Sambhal) and 16 female subjects from Government Girls Inter College Sirsi.

A group of 30 male subjects was drawn from the Hewit Muslim Inter College, Moradabad and 29 male subjects from S.S.K. Inter College, Moradabad and 34 male subjects from the KCM School, Civil Lines, Moradabad. Among the females, 46 subjects were selected from the Kasturba Gandhi Balika Vidalya, Moradabad, 39 subjects from Saraswati Vidya Mandir, Moradabad. 27 male and 17 female subjects drawn from Government Inter College, Moradabad and 12 male and 11 female from Gandhi Nagar Public School, Gandhinagar, Moradabad. The sample selected for the present research work comprised of students of IX standard. The detail of the sample is given in the next tables.
Table 3.1
Detail of sample

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Schools</th>
<th>Locality</th>
<th>Type of Schools</th>
<th>Medium of Instructions</th>
<th>Nob of Students</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>1</td>
<td>Mumtaz Modren Secondary School, Ikrotia sadat.</td>
<td>Rural</td>
<td>Private</td>
<td>English</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Government Girls Inter College, Sambhal.</td>
<td>Rural</td>
<td>Govt.</td>
<td>Hindi</td>
<td>-</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Sayyed Abbas Ali Memo. Pub. School, Sarai Sadak</td>
<td>Rural</td>
<td>Govt.</td>
<td>Hindi</td>
<td>35</td>
<td>03</td>
</tr>
<tr>
<td>4</td>
<td>Bal Vidya Mandir Inter college, Jagat.</td>
<td>Rural</td>
<td>Private</td>
<td>English</td>
<td>30</td>
<td>05</td>
</tr>
<tr>
<td>5</td>
<td>Government Inter College, Ikrotia (Sambhal)</td>
<td>Rural</td>
<td>Govt.</td>
<td>Hindi</td>
<td>41</td>
<td>19</td>
</tr>
<tr>
<td>6</td>
<td>Government girl’s college Pawansa.</td>
<td>Rural</td>
<td>Govt.</td>
<td>Hindi</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>7</td>
<td>Government Girls Inter College Sirsi.</td>
<td>Rural</td>
<td>Govt.</td>
<td>Hindi</td>
<td>-</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>Hewit Muslim Inter college, Moradabad.</td>
<td>Urban</td>
<td>Private</td>
<td>English</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>S.S.K. Inter college, Moradabad</td>
<td>Urban</td>
<td>Private</td>
<td>Hindi</td>
<td>29</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>KCM School, Civil Lines, Moradabad.</td>
<td>Urban</td>
<td>Private</td>
<td>English</td>
<td>34</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Kasturba Gandhi Balika Vidalya, Moradabad,</td>
<td>Urban</td>
<td>Govt.</td>
<td>Hindi</td>
<td>-</td>
<td>46</td>
</tr>
<tr>
<td>13</td>
<td>Government Inter College, Moradabad</td>
<td>Urban</td>
<td>Govt.</td>
<td>Hindi</td>
<td>27</td>
<td>17</td>
</tr>
<tr>
<td>14</td>
<td>Gandhi Nagar Public School, Gandhinagar, Moradabad.</td>
<td>Urban</td>
<td>Private</td>
<td>English</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.4 Research Tools Used


3.4.2 Test of Study Habits and Attitudes (T.S.H.A.) by Dr. Mathur, C.P. (2002).

3.4.3 Educational Aspiration Scale (E.A.S.) Form P by Dr. Sharma, V.P. and Dr. (km) Gupta, Anuradha (1996).

3.4.4 Examination results of the students were collected from the respective school by the researcher to know the academic achievement of the students.

3.4.1 Eysenck’s Maudsley Personality Inventory (M.P.I.)

The Maudsley Personality Inventory (MPI) is a brief, but standard inventory, which can be easily administered and scored and is designed for assessing neuroticism-stability and introversion-extroversion dimensions of personality.
It was developed by S.S. Jalota and S.D. Kapoor. It is suitable for normal and abnormal adults, and also for adolescents. This test can be used as a group or an individual test, for person of ages 15 to 16 years and above. The vocabulary required is that of the average newspaper. Although no time-limit is enforced in the testing but the short-scale takes about 3 to 5 minutes, while the long-scale takes about 15 to 20 minutes. Items from serial number 1 to 12 given on the front page of the test booklet make the short-scale, while all the 48 items of the booklet constitute the long-scale. Each of these items is answerable by making a tick-mark into one of the three boxes, at the end of each item. Instructions to answer the questions are given on the cover page of the test booklet.

**Reliability and Validity:**

The full scale was administered to 75 male and 75 female post graduate students at Chandigarh. For the full scale, the mean neuroticism score for the male and female groups combined was 23.2 with an S.D. of 10.0; this corresponded with English norms of 19.9, S.D. 11.0 (Eysenk, 1959; Jalota, 1964). For the extraversion scale, the mean combined score was 27.8 S.D.6.2; this compares with the English norms of 24.9, S.D. 9.7. There was no difference of any significance between males and females and the data suggests that the Indian group was slightly more neurotic and extraverted than the English standardized group. English, with the short scale are similarly showing a mean neurotic score of 7.1 (6.2 for the English group) S.D. 3.1 and E score of 8.2 (8.0 for the English group) S.D. 2.5. The standard deviations, here as in the long scale, are rather smaller for the Indian groups than for the English standardized group.

The correlation between N and E for the long scale was =0.223 which is in good agreement with the English norms. The reliability coefficient by comparing the 1st half with 2nd half, yields for N, = +.567, and E +. 358. When corrected to full length, these figures become for N, + .71, and for E, +.42. These figures are lower than the English data, but it is likely that an odd/even reliability would, in any case, give higher figures than would a comparison of
first half versus second half. The data suggests, that this Indian version of MPI gives results not essentially different from those obtained with original version in England, and it seems reasonable to conclude that these two personality dimensions can be found among Indian students (Srivastava, 1970; Kapoor 1969, Kapoor 1973) as well as among the various European and American groups (Eysenck, 1959) on whom the test had been standardized.

**Instructions for Administration:**

The test items are printed on both the covers of the test-booklet. They are 48 in number. This test can be administered individually as well as in groups. Although no time limit is enforced in the testing, but the short-scale takes about 3 to 5 minutes, while the long-scale takes about 15 to 20 minutes.

**Instructions for Scoring:**

The test is scored directly from the test-booklets. The test booklet should be scanned to ascertain that only one answer has been marked for each question. The scoring stencil should now be placed along the anchoring points made on the test-booklet. The raw-scores may be read off and added to give a total of N and E scores respectively.

**3.4.2 Test of Study Habits and Attitudes (T.S.H.A.)**

Test of Study Habits and Attitudes developed by Dr. C.P. Mathur was used to know the study habits of the students. This test is intended for use with school, college and university students, ranging from age 13+ years to adulthood. It is meant to measure the Study Habits and Attitudes of students. The test is suitable for use with both the sexes. It seeks to discriminate between good and poor study techniques of students, and is expected to be helpful to teachers and counselors to know their students’ techniques of study in a scientific way. This test is based on nine major areas of the study techniques, habits and attitudes, viz., Attitude towards Teachers; Home Environment; Attitude towards Education; Study Habits; Mental Conflict; Concentration; Home Assignment; Self-Conflict and Examination. It contains 60 items. A high score on this test
indicates high order of correct study habits and proper attitudes, while a low score shows poor study techniques.

**The Reliability:**

The reliability of this test was established by test-retest method. It was found to be-

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Age Groups</th>
<th>Reliability Co-efficient</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>13+ to 16</td>
<td>+0.87</td>
<td>200</td>
</tr>
<tr>
<td>2.</td>
<td>16+ and above</td>
<td>+0.89</td>
<td>200</td>
</tr>
</tbody>
</table>

**The Validity:**

For the purpose of establishing validity, the test has been validated with two tests of study habits as well as with Achievement (academic) scores on a representative sample of 200 students.

The coefficients were found as under:-

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tests</th>
<th>r</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Survey of Study Habits &amp; Attitudes in English- By C.P. Mathur</td>
<td>+0.63</td>
<td>200</td>
</tr>
<tr>
<td>2.</td>
<td>Survey of Study Habits &amp; Attitudes (General) By A.R. Purohit</td>
<td>+0.77</td>
<td>200</td>
</tr>
<tr>
<td>3.</td>
<td>Academic achievement Scores</td>
<td>+0.65</td>
<td>200</td>
</tr>
</tbody>
</table>

**Instructions for Administration:**

The test contains 60 items seeking response in ‘Yes’, ‘Doubtful’ and ‘No’. Responses are obtained on a separate answer sheet and the test booklet can be used over and again. The test is non-time. Generally 40 minutes have been found sufficient to deliver necessary instructions and obtain the responses.
Scoring:

A set of two scoring keys is provided for scoring the responses. Scoring key ‘A’ is meant to score the correct study habits and scoring key ‘B’ to know the items and corresponding areas in which the students need guidance. For scoring purpose, take scoring key and place it on the answer sheet. The two ‘anchoring’ points, one above and one below the column will be found helpful in setting the key accurately. Now count the number of correctly responded items visible through the perforations. This Number as per the key ‘A’ is the obtained score for correct study habits.

Before starting to score, see that to how many items the testee has put $\checkmark$ in the column (?) count these and if the $\checkmark$ in the column (?) are more than 3, then categorize the testee according to the following norms:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 to 03</td>
<td>Avoid considering</td>
</tr>
<tr>
<td>04 to 07</td>
<td>Indecisive</td>
</tr>
<tr>
<td>07 to 12</td>
<td>Confused and Indecisive</td>
</tr>
<tr>
<td>13 and more</td>
<td>Highly confused and indecisive</td>
</tr>
</tbody>
</table>

3.4.3 - Educational Aspiration Scale (E.A.S.)

Educational Aspiration Scale (Form P) developed by Dr. V.P. Sharma and Dr. Anuradha Gupta was used to know the educational aspiration level of the students. The Educational Aspiration Scale Form P has been developed by taking into consideration the variables operating in the past and present, so far as setting the level of educational aspirations in future is concerned. Paired comparison technique has been employed. By resolving these primary variables into different factors which could be effective in the past, present and future, 45 items designed in the paired comparison form have been developed. These items have been refined several times from the point of view of the phraseology, structure and presentation.

The Reliability:

(a) Coefficient of stability by Test-Retest method. $r_{tt} = .98$
(b) Coefficient of internal consistency by odd-even technique using S-B formula......

\[ r_{tt} = 0.803 \]

**The Validity:**

(a) Against scholastic achievement (Board Exam.) \[ r = 0.692 \]
(b) Predictive validity with E.A.S., Form V \[ r = 0.596 \]

**Instructions for Administration:**

Educational Aspiration Scale could be administered in a group situation. It is a self-explanatory scale; however, the tester should establish proper rapport before administering it. There is no time limit; however, it takes about 25 minutes to administer the whole scale.

**Scoring:**

There are no right and wrong answers. The subject has to compare between a pair of statements given in each of the items, and weigh one of these two by putting a cross-mark against it. Scoring key has been prepared for EAS with the help of five judges. Two category responses have been admitted. Either the response would be scored as 1 or as 0. The maximum score is 45 whereas the minimum is 0.

3.4.4- Examination results of the students were collected from the respective schools by the researcher to know the academic achievement of the students.

**3.5 Data Collection Procedure**

Collection of data was a very painful task. Investigator faced many difficulties during the collection of data, especially in rural areas. Data was collected by the investigator herself. First of all, permission was sought for the data collection from the principals of the schools, by explaining the purpose of the study. After permission was granted, the investigator administered the tools. For the data collection, the investigator approached each Muslim male and
female student of IX standard personally and persuaded them to supply necessary information correctly and frankly.

The investigator assured the students that the information provided by them would be kept confidential. Then, the investigator distributed all the three tools among the students and explained to them the directions to fill the tools. The investigator requested the students to feel free and comfortable. The investigator explained to them the meaning of the words or sentences which they found difficult, and cleared every doubt and confusion from time to time.

There was no time limit for the completion of the questionnaire. After completion of the questionnaire, it was collected by the investigator from the students and checked whether all the entries were filled properly or not. Mark-sheets of the students were also collected to know the academic achievement of the students.

3.6 Statistical Techniques Used

For the purpose of the analysis, following appropriate and compatible statistical techniques were used.

1. Mean (M)
2. Standard Deviation (SD)
3. t-test
4. correlation
5. multiple regression

Mean is also called ‘arithmetic mean’ or an ‘average’. It is computed by dividing the sum of all the scores by the number of the scores. The formula of arithmetic mean (M) for grouped data:

\[ M = \frac{\sum fx}{N} \]

Where N is the number of measurements or the sample size, X is the scores or measurements and the symbol of \( \sum \) means ‘sum of’.

Standard deviation or SD is regarded as the most stable and reliable measure of variability as it employs the mean for its computation. Standard deviation is the
square root of the average of the squares of the deviations of each score from the mean. It is often called root mean square deviation and is denoted by the Greek letter sigma (\(\sigma\)). The formula for standard deviation for grouped data:

\[
\sigma = \sqrt{\frac{\Sigma f x^2}{N}}
\]

\(N\) is the number of measures in the series, \(x\) stands for deviation scores (\(x = X - M\)) and \(\sigma\) means ‘sum of’.

In an experimental or any other kind of study, a researcher may be concerned with finding out the significance of difference between two independent or correlated samples. The statistics used for such a situation is known as ‘t’ test.

The ‘t’ value gives a critical ratio of the difference of means and the standard error of difference of means. On the basis of ‘t’ value, we reject or retain the null hypothesis which postulates that the observed difference is attributable to chance fluctuation of the sample. When the two means to be compared are based on large samples, t-test may be used.

The formula is:

\[
t = \frac{|M_1 - M_2|}{\sqrt{\frac{N_1 \sigma_1^2 + N_2 \sigma_2^2}{N_1 + N_2 - 2} \left[ \frac{1}{N_1} + \frac{1}{N_2} \right]}}
\]

Where \(M_1\) and \(M_2\) are two sample means based on the samples of sizes \(N_1\) and \(N_2\) respectively, and \(\sigma_1\) and \(\sigma_2\) are corresponding standard deviations. This formula was used to know the ‘t’ value whenever comparison between two independent means was made. The table of t-value was also used for the same purpose.

To know the relationship of the variables with each other correlation was used. In this study co-efficient of correlation was used. Pearson’s product moment method was used. The co-efficient of correlation computed by this method is known as the product moment co-efficient of correlation or Pearson’s correlation co-efficient and symbolically represented by \(r\). The standard
formula used in the computation of *Pearson’s product moment* correlation coefficient is as follows:

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

Multiple regression is a statistical method used to examine the relationship between one dependent variable and one or more independent variables. *Multiple regression* is a method for studying the effect and the magnitudes of the effects of more than one independent variable on one dependent variable using principles of correlation and regression.

The basic equation of simple linear regression is:

\[
Y' = a + bX
\]

Where \( X \) = the scores of the dependent variable, \( a = \) intercept constant, \( b = \) regression coefficient, \( Y' = \) predicted scores of the dependent variable. A regression equation is a prediction formula: \( Y \) values are predicted from \( X \) values.

For studying the effect of more than one independent variable on one dependent variable, the regression equation is:

\[
Y' = b_1X_1 + b_2X_2 + b_3X_3 + \ldots + a
\]

Where \( Y' \) is the predicted value of \( Y \) for known values of \( X_1, X_2, X_3, \ldots \) etc., and \( b_1, b_2, b_3 \ldots \) etc. are the corresponding regression coefficients. ‘\( a \)’ is the constant for the given equation.

Since the study comprised more than two independent variables, manual calculations were not easily possible. Therefore, Statistical Package for Social Sciences (SPSS) 16.0 was used to conduct various statistical analyses. Chapter IV presents the analyses and interpretation of data.