CHAPTER-2
METHOD AND PROCEDURE

The objective of present study was to study the relationship of academic anxiety, achievement motivation, academic achievement motivation to non-verbal intelligence and academic achievement of senior secondary schools students studying in Govt. Senior Secondary Schools situated in Kangra district of Himachal Pradesh. To achieve the objectives of study, it was required to draw an adequate sample of Senior Secondary School students; select suitable tools for measuring the characteristics under study; and collect the relevant data with the help of these tools. The details regarding these aspects of study are given as under.

2-1 Method

By method one means a systematic approach towards a particular phenomenon. Methodology used in an investigation, in fact, determine its density. It is nature of techniques and procedures adopted which determines the reliability, precision and validity of the data. Therefore, it is essential that in order to investigate the problem in scientific way, the right type of method be used. The present study was aimed at studying the relationship of academic anxiety, achievement motivation, academic achievement motivation, to non-verbal intelligence and academic achievement. In other words, the present study sought to describe and interpret what conditions or relationships exist at present in case of Senior Secondary school students with respect to variables academic anxiety, achievement motivation, academic achievement motivation, non-verbal intelligence and academic achievement. The further purpose of study was to collect detailed description of existing phenomenon with the intent of employing the same to justify current conditions and
practices and to make intelligent plan for taking appropriate decisions. Hence it was decided to use descriptive method of research in present study which was relevant and justified in view of the objectives of study.

2-2 The Sample

Sampling is the basis of any scientific investigation. Since in educational research it is neither practically expedient nor scientifically desirable to approach to the total population, therefore, technique of sampling is employed in which instead of every unit of population being tapped only a part of population is drawn and studied.

In present study the sample was drawn from 20 coeducational Govt Senior Secondary schools situated in Kangra district of Himachal Pradesh. It is worth mentioning that all these schools followed the curriculum prescribe by the Himachal Pradesh Board of School Education. Due to paucity of time and limited scope of the study, the schools were selected on the basis of convenience. However, it was observed that the selected schools are spread over a wide area.

From each school a sample of 10 students (5 boys and 5 girls) were selected randomly by lottery method. Finally, the total sample consisted of 200 (100 boys and 100 girls) students. The detailed distribution of the sample selected for the present study is given below.
Table 2.1 The Distribution of Sample

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of School</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>G.S.S.S. BharoliKohala</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>G.S.S.S Surani</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>3.</td>
<td>G.S.S.S Haripur</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>4.</td>
<td>G.S.S.S NagrotaSurian</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>5.</td>
<td>G.S.S.S. Bagli</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6.</td>
<td>G.S.S.S Dari</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>7.</td>
<td>G.S.S.S Chachian</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>8.</td>
<td>G.S.S.S Bindraban</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>9.</td>
<td>G.S.S.S. Rait</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>10.</td>
<td>G.S.S.S Shahpur</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>11.</td>
<td>G.S.S.S Dhallara</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>12.</td>
<td>G.S.S.S Dadashiba</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>13.</td>
<td>G.S.S.S Balugloa</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>14.</td>
<td>G.S.S.S Kothar</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>15.</td>
<td>G.S.S.S Bhawarna</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>16.</td>
<td>G.S.S.S Dheera</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>17.</td>
<td>G.S.S.S Daulatpur</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>18.</td>
<td>G.S.S.S Samloti</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>19.</td>
<td>G.S.S.S Ghallaur</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>20.</td>
<td>G.S.S.S Lanj</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
<td>100</td>
<td>200</td>
</tr>
</tbody>
</table>

2-3 Tools Used

Every scientific research is processed through certain well designed tools. Tools are nothing but the instruments that help the researcher to gathers data. To collect the requisite data for the present study the investigator used academic anxiety scale for
children, Costello achievement motivation scale and Sharma academic achievement motivation test, and Raven’s standard progressive matrices.

2-3.1 Academic Anxiety Scale for children (AASC) by Dr. A.K Singh and Gupta

Dr. (K.M) A Sen Gupta (1986)

The Academic Anxiety Scale has been developed for use with school students of class VII, IX and X (age range; 3-16 years) the preliminary form of the Academic Anxiety Scale for children has 30 items after carry out item analysis based upon Kelley technique (1939) only 20 items were retained and the remaining 10 were dropped.

Scoring

The maximum possible score of this test is 20. In Academic Anxiety Scale for children, each item of test is scored as either +1 or 0 there are two types of items positive and negative. All positive items which are endorsed by subjects as yes’ and all negative items no. 4,9,16 & 18 which are endorsed by the subjects as No are given a score of +1. A score of zero is awarded to all other answers. Thus, high score on test indicates high academic anxiety and low score on test indicates low academic anxiety.

Reliability

The reliability of the AASC test was computed through two methods that is test retest method and the split half method. In order to compare compute the test retest reliability, the test was administered twice on a sample of 100 pupils with 14 days gap subsequently, Pearson r was computed between the two sets of scores. The obtained Pearson r was 60 which was significant beyond .01 level for the split half reliability of test, it was administered on a fresh sample one hundred. Subsequently ,test was splited by the odd even method. The resulting odd-even correlation coefficient was .433 (p<.01) which after being corrected for full length, became .65
Validity

The present test (AASC) has been validated against the Sinha-Anxiety scale, Neuroticism scale and CAAT. Former tests are the measure of general anxiety and the latter tends to measure academic anxiety among school children. Table 2 present the validity coefficient of AASC against the different measure. Against the Neuroticism scale, value of correlation coefficient is .31 and against the Sinha Anxiety Scale and CAAT, the value of correlation coefficient is .41 and .57.

On the basis of obtained correlation coefficients it can be said that academic anxiety scale for children (AASC) is a valid test.

2-3.2 Costello Achievement Motivation Scale Adapted by O.P. Misra and S.K. Srivastava

Achievement Motivation has most often been measured by TAT and TAT like stimuli the attempt of C.G. Costello (1967) to measure achievement motivation is a successful venture in the direction. It is a standard and easily administered inventory which is designed to assess achievement motivation of a person. It is a suitable for adolescents and adults and can be used as group or individual test although, there is no time limit, it takes about 15 to 20 minutes to complete all twenty for times of test. Each of these items can be answered by making a tick (✓) mark under ‘yes’ or ‘no’ category.

Hindi Adaptation

A successful use of achievement motivation scale (AMS) constructed by C.G Costello in and Canada and elsewhere encouraged the authors to adopt it in Hindi for those person who belong to Hindi speaking belt and cannot understand the meaning and spirit of English sentences and phrases. Besides, there was need for such an inventory college going students and persons working I industries.
Costello’s AMS was taken its original form and was given to five Psychology teachers and research scholars who were well used in Hindi and English languages. They were requested to translate it in Hindi. For the purpose of selecting a suitable Hindi version of the items, all the five Hindi versions and original English version were given to 10 teachers and research scholars of Psychology for their opinion. In the end, most favoured items were selected to construct the scale. This version was administered upon 50 under graduate students and 50 persons working in industries. Both the sexes were actually represented. After interviewing thee respondents, some items were recorded, for the final Hindi Version of test with a view to ascertain the equivalence of English and Hindi version, both the version were administered upon 60 students in the age range of 17 to 21 years. Score obtained by the students on both the version were correlated. The correlation was found to be 0.88 which was significant at .01 level and suggests that Hindi version of AMS is an adequate parallel form of the original test.

Reliability

Reliability refers to consistency and dependability of test scores. For the purpose of calculating the reliabilities the samples were drawn from GurukulKangri University, Roorkee university and colleges of Garhwal and Meerut universities, the industrial employee were taken from the public and private sector enterprises of Kanpur. The age range of student sample was from 17 to 21 years and the age range of industrial employees was 30 to 48 years. There were two samples of college students taken for calculating reliability. For sample -1 the reliability coefficient by test- retest method and split half was found 0.80 and 0.82 respectively. For sample -2, the reliability coefficient was found 0.77 and 0.88 by test-retest and split half method.
Validity

Validity of test refers to the ability of the test to measure, what it claims to measure. In the process of constructing the scale and investigating the factors of AMS, Costello administered an inventory containing 100 items upon 191 men and 191 women. The 100 items of inventory were inter correlated by means of phi coefficients. Unities were placed in the diagonals of the correlation matrix. Ten factors were extracted from the original correlation matrix by the principal axis method and the factors were related to orthogonal simple structure using Kaiser is normalized varimase accretion. It has been decided prior to the study to factoring after the extraction of 10 factors, since it was unlikely that more than ten significant factors would be found.

The first two factors accounted for 24 percent of the total variance. None of the other factors accounted for more than 2 percent of the total variance. For each of these factors, following the method of Bending (1962) the squared factor loading of each items was multiplied by the variance of the item to derive absolute measures to the amount of factor variance contributed by the item. The 14 items with the largest variances attributable to the first factor and with the smallest variances attributable to the variances on the first factor were selected.

In the second study conducted by Costello, the 34 items were administered upon 200 additional college students. 100 men and 100 women, the items were inter correlated using phi-coefficients and a factor analysis was performed using only two factors which were extracted and rotated. The ten of the 34items either had too low or too high factor loadings and the two factors they were dropped, the final from consisting of 24 items.

An attempt has also been made to validate the test by showing that recognized high achievers score high on this test. Two groups of high achievers has been
investigated and their scores have been compared with norms. However the test is designated primarily for use on people in executive positions and University students.

The first groups were high achievers. The second group was composed of 25 executives who have achieved above average success in their field. They were rated as high achievers and were occupying top positions in Industry.

These two groups were compared with university higher on the test than the students criterion groups differ from students in achievement score, but also in age. The difference has not been considered significant because. The students conducted in this area show that the correlation between age and achievement motivation is totally insignificant.

**Scoring and Interpretation**

The AMS is a forced choice test consisting of 24 items, which are to be responded as ‘Yes’ or ‘On’. The test is directly scored from test booklet question no. 2,3,5,7,9,11,13,17,19,20,22 and 24 are given one mark if answered positively by the subject. These items will be assigned zero if answered in negative manner. Likewise item no. 1,4,6,8,10,12,14,15,16,18,21 and 23 are awarded one mark if answered in positive manner. Maximum possible score is 24. A high score reflects high achievement motivation.

**2-3.3 Sharma Achievement Motivation Test by Dr. T.R. Sharma (1984)**

At list of statement, each of which was followed by three alternatives was subjected to a coversazione participated by nearly forty. Subject experts in order to the items form to and 49 these 49 items with two alternatives each were tried on 100 students selected at random from schools of Patiala between 11 to 15 years of age. After scoring point biosocial & between total test score and item score was calculated in respect of each item by using the formula $r_{pbis} = \frac{N_p - N_q}{SD_t} \sqrt{pq}$ (Gilford, 1965), I
was found to be insignificant in case of 11 items, so the some were dropped. Only 33 items were retained and some constitute the test.

**Reliability**

Three methods were tried to determine the reliability of the test. By split method, the reliability whole test was found to be 0.697 and by rational equivalence method the reliability was found to be 0.7506. reliability coefficient by test retest method was found 0.715 and 0.807.

**Validity**

Three types of validities- Content, Criterion and Construct, were established. The items of the test were selected on the basis of pooled judgement of nearly 40 judged in the field of testing. This sufficed for content validity. For criterion validity, on the basis of considered judgements of class teachers twenty students, ten low on the achievement motivation and ten high on achievement motivation were administered this test under standardization significant differences were found in the mean test-scores of two groups.

Each items was correlated with total test and items. Showing not significant r were deleted from the test. This established the construct validity of test. The construct validity was found to be 6.30.

**Administration**

The test can be administered to a group of not more than 40 children at a time. The subjects have to be seated separately so that they are not tempted to consult and another. The directions given on booklet be read out after sheets have been distributed with the help of the black–board. The two examples provided in test booklet be explained to the children.
Scoring

Award one mark of box A has been ticked in case of items No. 1,2,3,4,6,8,10,12,13,15,16,17,18,21,25,27, 31, 35,35, 37. And if box B has been ticked in case of items of Sr. No. 5, 7,9,11,14,19, 20, 22, 23, 24, 26, 28, 29, 30, 32, 33, 34, 38.

2-3.4 Standard Progressive Matrices by Raven, Court and Raven (1977)

For measuring non-verbal intelligence of the students of different treatment groups taken for the study, standard progressive matrices developed of Raven, Court, and Raven (1977) was used in present study.

Raven’s standard Progressive Matrices (SPM), published in 1938 was constructed on a prior assumption that, if Spearman’s (1923) principles of noegenesis were correct, it should provide a test suitable for comparing people with respect to their immediate capacities for observation and clear thinking. The SPM (sets A,B, C, D and E) is a test of a person’s capacity at the time of the test to apprehend meaningless figures presented for his observation, see the relations between them, conceive the native of the figure completing each system of relations presented, and, by so doing, develop a systematic method of reasoning. The scale consists of 60 problems divided into five sets of 12. In each set the first problem is as nearly as possible self-evident. The problem which follow become progressively more difficult. The order to the items provided the standard training in the method of working. The five sets provide five opportunities for grasping the method and five progressive assessments of a person’s capacity for intellectual activity. To ensure sustained interest and freedom from fatigue, the figures in each problem are boldly presented, accurately drawn and, as far as a possible, pleasing to look at.
SPM has been designed to cover the widest possible range of mental ability and to be equally useful with persons of all ages, what ever their education, nationality or physical condition. The scale also provides a reliable estimate of a person’s capacity to think clearly when he is allowed to work steadily at his our pace from the beginning to the end without interrupting. The scale, unlike most of the intelligence tests, is a power test and every individual is allowed to complete the whole of the scale before stopping. A person’s total score provides an index of his intellectual capacity, with relatively little influence from the cultural environmental in which the individual grew up or his education. The contribution which each of the five sets make to be total provides a means of assessing the consistency ‘of the estimate and the psychological significance of discrepancies in the test results. A number of studies have been conducted over a wide range of age, cultural groups, and educational levels to estimate the reliability of the test. These studies indicate the split half reliability for the test to be 0.90 and test-retest reliability between a range of 0.80 to 0.90 depending upon the time interval further the test has also been shown to have fairly high degree of criterion-oriented, content, and factorial construct validity.

The manual of test provides the detailed procedure for its administration in individual or group setting, scoring procedure, as well as different types of norms. The total score of an individual is the number of items solved correctly by him.

2-4 The Procedure

Keeping in views the objectives of the present study the investigator collected the data with the prior permission of the principal of the concerned institutions mentioned in Table 2.1. Before administering of tools, the requisite number of students were taken randomly from class XI as discussed Under ‘Sampling’.
After this, the selected students were administered Academic Anxiety Scale. The instructions regarding filling up the scale were read out loudly and clearly to students. Thereafter the students were asked to respond the items. After completing the booklet, Sharma Academic Achievement motivation test were administered. The instructions regarding filling up the test were explained. After filling this booklet, Costello Achievement Motivation Scale was distributed to selected students and explained the instructions. Thereafter the students were asked to respond. After giving a gap of about 10 minutes, the students were administered Raven’s Progressive matrices. The students were given all the necessary instructions before starting the test. After completing the administration of all the four tools, the investigator collected the test booklets back from the students and thanked the class teacher and the students for their whole hearted cooperation.

The aggregate academic Achievement scores of the students for class X were noted from school records.

The tools were scored according to the procedure given in the perspective manuals. The scores thus obtained were tabulated in the register for further analysis.