CHAPTER 3

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CHAPTER–3

METHODOLOGY

“Research is the systematic application of a family of methods that are employed to provide trustworthy information about problems. Educational research is the systematic application of a family of methods that are employed to provide trustworthy information about educational problems. Most researchers, including educational researchers, undertake their inquiry to gain understanding about some issue or topic that they don’t fully comprehend. Having a stake in the outcome of the research makes conducting research more interesting and useful for the researcher.” (Gay, & Airasian, 2000, p. 3)

3.1. RESEARCH DESIGN

The problem of the present research belongs to co relational study and Radha, M.(2003) defined correlation studies “Co relational studies are concerned with determining the extent of relationship existing between variables. They enable one to measure the extent to which variation in one variable is associated with another. The magnitude of the relationship is determined through the use of the coefficient of correlation....The idea of such studies is exploration rather than theory testing.”

The co-relational study is one of the subcategory of descriptive research. Best (1977) defined, Descriptive research describes and interprets what is concerned with conditions or relationships that exist; practices that prevail; beliefs, points of view, or attitudes that are held; process that are going on; effects that are being felt; or trend that are developing.

Hence, a co-relational descriptive method was adopted for this study. The study was conducted exclusively for the tenth standard urban and rural students in various Government (Govt.) & Private-Aided secondary schools of Haryana districts selected randomly. The opinions of adolescent students have helped the researcher to gain valid information about the topic concerned. The research method used for this study has enabled the researcher to
find out the relationship between the variables to compare the performance of the boys and girls in both the localities (urban & rural) in Govt. and Private-Aided Schools Secondary of Haryana. The various steps in methodology are Sample and Sampling Technique, Tools for data collection, Data Collection procedure and Data Analysis Technique.

3.2. SAMPLE AND SAMPLING TECHNIQUE

Population, Size of the sample, guideline for fixing the size of sample, sampling method and sampling procedure are detailed in this section.

3.2.1. Population

The term population, as used in research, refers to all the members of a particular group. It is the group of interest to the researcher, the group to whom the researcher would like to generalize the results of a study. A population is a complete set of measurements (or individuals or objects) having some common observable characteristics (Elmes, Kantowitz, & Roediger, 2006, p. 375). The population of this study includes “all the secondary school students of Tenth standard studying in Haryana Board of Secondary Education during the academic year 2012-2013.”

![Study Area Map](image.png)

Fig. 3.1. District map of Haryana (1 to 5 Study Area)
3.2.2. Sample

The purpose of sampling is to gain information about the population by using the sample. A crucial issue in survey research relates to the sample that is surveyed. The researcher wants the sample to be representative of the population for whom the questions are designed. A sample is a subset of a population, and it is what we are usually examining when we compare experimental conditions. Thus we make statistical inferences when we draw a conclusion about an entire population on the basis of only a sample of observations (Elmes, Kantowitz, & Roediger, 2006, p. 97, 37)

It is extremely important to think about the size of the sample to be selected. If the sample is either too small (or) too large, it will make the study difficult and the results untenable. According to Parten, “An optimum sample in survey is one which fulfills the requirements of effective representatives, reliability and flexibility. The sample should be small enough to avoid intolerable sampling error”. Therefore, the size of sample for the present research work was decided after considering the following factors.

Factors considered for Sample Size:

(i) The present study was of intensive nature. A small sample has been preferred so that huge expenditure on resources could be avoided.

(ii) Further, size of the sample is influenced by the nature of universe. If the universe is homogeneous, even a small-sized sample may yield dependable and required results. If the universe is heterogeneous, small-sized samples may not be useful. In case of the present study the heterogeneous universe was split into smaller homogeneous strata (or) groups and then the samples were selected from these strata. For example, Xth class students of Sonepat, Panipat, Karnal, Kurukshetra and Kaithal Districts were broadly grouped under boys and girls, Government and Private- Aided school students, urban and rural students. A sample was selected from each of these groups.

(iii) In case the number of groups proposed is large, the size of the samples shall have to be large so that every group is of proper size and suits the requirements of the study; in case the number of groups proposed is small, even small-sized samples can fulfill the requirement. In case of the present study, the universe was divided into boys and girls students, Government and Private-Aided school students, urban and rural school students. Since the number of groups was moderate, a reasonable sample was selected from each of these groups.
(iv) Undoubtedly, a large-sized sample is more representative and usually produces accurate results. But, if the sampling technique is scientific, even small-sized samples can produce dependable and accurate results. While selecting the size of the sample for the present study, practical considerations like the availability of resources and time taken into care and the sample selection technique was scientific based.

(v) The size of the sample is also governed by the size of the tools to be used. In case the tools are short and the questions asked pertain to certain limited factors, large sample can be selected. In case the tools are large and the questions complicated, the sample has to be small in size so that the researcher administered may not put to unnecessary troubles. In the present study, the tool selected belonged to affective domain, so a very large sample was not selected.

(vi) The sampling method also determines the size of the sample. When random sampling method is used, the samples have to be large. On the other hand, if samples are selected through stratified sampling method, the reliability can be achieved even with the help of the small-sized samples. Taking these factors into consideration, it was decided to take an ideal sample of 600 students. This sample is small enough to avoid unnecessary expenditure and large enough to avoid intolerable sampling errors.

3.2.3. Sampling Method

Sampling is simply the process of learning about the population on the basis of a sample drawn. Various methods are used for selection and drawing of samples. After a detailed study of all these methods and taking into the consideration the variables selected for the research work, “the stratified random sampling method” was found to be most suitable. In this method, entire population is divided into smaller homogeneous groups (Best) or strata, and then the sample is selected within each group randomly. Every sampling unit in the population is placed in one of the strata prior to the selection of the sample so that the sum of the strata is identical with the population.

Except above, this method is more attractive because Investigator has greater control over the selection of the sample when compared with random sampling. In random sampling, although every group has a chance of being selected and included in the sample, there is every possibility, and sometimes it does not happen, that certain important groups are left unrepresented, but in stratified random sampling method no important group is likely to be left out.
Stratified sampling method is also ideal one when comparison between different variables has to be made. For example, in the present study if comparison has to be made between boys and girls students, Government and Private-Aided school students (or) rural and urban students, it would be very difficult to select the required number of units through any other method of sampling and chance of the problem of bias and prejudice creeps in.

This technique provides a considerable saving of time, effort and finance. The number of students selected is not so small or so large. Therefore, it is possible to make a detailed and intensive study. This also leads to more accurate and reliable results. Hence, the same was selected for the collection of data.

Stratification process plays a vital role in stratified sampling method. While stratifying the population, care was taken to see that each stratum in the universe was large enough in size so that selection of items could be done on random basis; the strata formed were definite and clear cut; each stratum was free from influence of the other; and there was no overlapping. Following precautions were also observed.

Firstly the ‘universe’ was clearly defined. According to technical phraseology of research the whole population out of which the samples are selected is known as the ‘universe’. Thus, for the present research work the universe includes all the X class students studying in secondary schools of Haryana. To facilitate appropriate sample selection and to avoid wastage of time and money, the study was decided to a limited geographical area, viz., Sonepat, Panipat, Karnal, Kurukshtetra and Kaithal Districts.

Secondly, decision was also made about the units of the sample. A unit of sample may be a house, a family, a group of individuals (or) a single individual. As a good unit possess the characteristics of clarity, suitability and acessability.

(i) **Clarity**: the unit should be clearly defined in unambiguous terms. This would make the study easy and efficient. For the present research work, a sampling unit is defined as X class students studying in any secondary school of Sonepat, Panipat, Karnal, Kurukshtetra and Kaithal districts.

(ii) **Suitability**: A good unit should be well suited to the problem under study. Since the problem is the possession and comparison of achievement motivation, learning style, parental involvement & academic achievement of the tenth class students of Haryana, the unit selected is well suited to the problem.
(iii) **Accessibility**: The unit selected should also be easily accessible to the researcher. If otherwise he will fail to use them the study would be vitiated. The selected sampling units, i.e. students studying X class in secondary schools are easily accessible since they could be approached in any secondary school as identified above.

Thirdly, availability of sample and preparation of the source list are very much essential. This is an important factor that makes representative selection possible. A source list is the list which contains the names of the units of the universe from which the sample may be selected. It may exist even before the beginning of the project (or) it may be prepared afresh by the investigator himself. Without a source list, study through sampling method is not possible. For the present research work, a source list consisting of the names of Govt. and Private-Aided secondary schools in Sonepat, Panipat, Karnal, Kurukshetra and Kaithal districts was obtained from the Haryana Govt. website [http://www.hbse.nic.in](http://www.hbse.nic.in). Care was taken to see that the source list was up-to-date and valid and that there was no repetition of names of the schools. This source list was found to be relevant and suitable because it included secondary schools as the study deals with the characteristics of achievement motivation, learning style, parental involvement & academic achievement of the tenth class students of Haryana.

### 3.2.4. Sampling Procedure

After deciding about the sampling method, the universe selected was divided into different strata. The variables chosen for the study were considered for dividing the universe. The sampling design employed here involved not only the stratification of universe but also random sampling technique to select samples from within the stratum. The total sample of 600 students consisted of boys (300); girls (300); Govt. boys (150); Private-Aided boys (150); Govt. girls (150); Private-Aided Girls (150); Govt. urban boys (75); Govt. rural boys (75); Private-Aided urban boys (75); Private-Aided rural boys (75); Govt. urban girls (75); Govt. rural girls (75); Private-Aided urban girls (75) and Private-Aided rural girls (75).
3.2.5. Control of Extraneous Variables

In order to prevent threat to internal validity of the study, the researcher has tried to control the effect of the extraneous variables as mentioned below:

1. **Gender**: Boys high school students & Girls high school students

2. **Locality**: Urban background students & rural background students.

3. **Management**: Government high School students & Private-Aided high school students.

The rationale of selection of these variables in this study is discussed as under.

1. **Gender**: Girl’s education, now-a-days, has gained much importance. They are pursued for higher education by the parents. As the psychological conditions, exposure to the society, education and other aspects of Boys and Girls vary differently; therefore, may be a significant difference in their possession of achievement motivation, learning style, parental involvement & academic achievement characteristics. A comparative study between boys and girls of high school may reveal, whether any differences exist in the possession of achievement motivation, learning style, parental involvement & academic achievement characteristics.
Criteria for selecting Tenth standard Boys and Girls:

(i) Tenth standard boys and girls fall in the stage of adolescence period and hence, has a tremendous effect on students achievement in school in his or her life. It is the period of physical development and decision-making when maturity is attained. Therefore, this age group is the most sensitive and creative age group of the students. These students are aware of the responsibility upon them. Therefore, this period is the most crucial period for all-sided development.

(ii) 10th standard is the terminating age in the life of adolescent students and basis for their life to choose their carrier options.

(iii) Furthermore, Tenth standard students in secondary schools, in India, face the board examination which makes them fully motivated and well prepared for their exams. This status enables the researcher to carry out investigation at their best efforts in their academic achievement.

2. Locality or Background of the student: The students residing in an urban area were considered as ‘Urban background’ and the students residing in rural area were considered as ‘Rural background’ high school students but both of them study together in a same type of school. The rural and urban high school students in actual differ widely in their achievement motivation, learning style & parental involvement related to their academic achievement. So a comparison between rural and urban high school students may bring difference if any in their achievement motivation, learning style, parental involvement & academic achievement characteristics.

Criteria for selecting Urban and Rural Background:

As discussed earlier under review of literature the large number of research assessed on location of school rather than location of residence of students, whereas, in the present study location of residence of students was studied as one of the variable. There were hardly any studies conducted on the students’ with background of urban and rural residence. The students of rural background were residing in rural areas and went for study in schools of urban areas and the students of urban background were residing in urban areas and also study in the urban areas but with the rural background students.
3. **Management of the school**: The schools managed by private organization (or) persons, either partially (or) totally and received some aid from Govt. were included in Private-Aided schools. The schools under sole management of Government officials were included under Government schools. So the schools managed by Mandal Parishads, Zilla Parishads, Municipalities, Municipal Corporations (or) Government were included in this category. So, a comparison between these two types of management school students may reveal difference if any in their achievement motivation, learning style, parental involvement & academic achievement characteristics.

**Criteria for selecting Govt. & Private-Aided schools:**

(i) It was observed that students in Govt. and Private-Aided schools had variations in academic achievement. This variation may be due to better facilities of the buildings, libraries, laboratories, teaching staff, educational atmosphere, competitive spirit among the students, amenities provided to students to pursue education, the exposure to fairs and exhibitions, student participation in teaching-learning process, the use of audio-visual aids, etc., in aided schools than the Govt. schools.

(ii) Students from Govt. and Private-Aided schools constitute a sample that is generally from same socio-economic status, hence they have many similarities.
<table>
<thead>
<tr>
<th>Districts</th>
<th>S.No.</th>
<th>Name of Schools</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td>KARNAL</td>
<td>1.</td>
<td>Govt. Boys Sr. Sec. School, Karnal</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>Govt. Girls Sr. Sec. School, Karnal</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td>GSSS, Subhri, Karnal</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>4.</td>
<td>D.A.V. Girls Sr. Sec. School, Karnal</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>5.</td>
<td>D.A.V. Sr. Sec. School, Karnal</td>
<td>30</td>
</tr>
<tr>
<td>PANIPAT</td>
<td>6.</td>
<td>G.M. S. Sr. Sec. School, Panipat</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>7.</td>
<td>S.D. Girls Sr. Sec. School, Panipat</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>8.</td>
<td>Arya Sr. Sec. School, Panipat</td>
<td>30</td>
</tr>
<tr>
<td>KURUKSHETRA</td>
<td>9.</td>
<td>GSSS, Amin</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>10.</td>
<td>GHS, Pipli</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>11.</td>
<td>Arya Sr. Sec. School, Thanesar</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>12.</td>
<td>Geeta Girls Sr. Sec. School, Thanesar</td>
<td>0</td>
</tr>
<tr>
<td>KAIRTHAL</td>
<td>13.</td>
<td>GSSS, Barot Bandrana</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>14.</td>
<td>GGSSS, Barsana</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>15.</td>
<td>GSSS, Cheeka</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>16.</td>
<td>GGSSS, Cheeka</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>17.</td>
<td>Hindu Sr. Sec. School</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>18.</td>
<td>A.S. Arya High School, Pundri</td>
<td>0</td>
</tr>
<tr>
<td>SONEPAT</td>
<td>19.</td>
<td>GSSS, Sonepat</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>20.</td>
<td>GGSSS, Sonepat</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>21.</td>
<td>T.R. Girls High School</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>22.</td>
<td>S.M. Hindu High School</td>
<td>35</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td>332</td>
</tr>
</tbody>
</table>
3.3. TOOLS OF STUDY

3.3.1. Selection of Tool

Research tool is the sole factor in determining the sound data and in arriving at perfect conclusions about the study problem in hand. A variety of research tools has been developed to aid in the acquisition of data. These tools are of many kinds and employ distinctive ways of describing and quantifying data. Each tool is particularly appropriate for certain sources of data yielding information of the kind and in the form that would be most effectively used. Each is appropriate in a given situation.

The selection and use of tools has two options. The first one is to construct a tool independently by the investigator for his own study. But, there are many problems in doing so because preparation and standardization of a perfect tool itself is a major task involving huge time and energy. Hence, not appropriate for the present study.

The second option is the selection of a tool from standardized tools already available in the field of study. Such tool is very useful, where a research involves a good number of variables. Even otherwise, due to lack of time and financial resources, it is the most logical procedure to choose the best instrument available for his purpose.

**Questionnaire**: It is a form containing a series of questions related to some psychological, social, educational or any other topic with space provided for indicating the response to each question, intended for submission to a number of people for reply with the object of obtaining data with regard to some problem. It helps to get information about interests, attitudes, opinions, Judgments, or facts. Barr Davis and Johnson (1952) define questionnaire as “A systematic compilation of questions that are submitted to a sampling of population from which information is desired”.

Questionnaire falls under data gathering devices which make use of properly prepared forms for inquiring into and securing information about certain phenomena under study. Generally the word ‘questionnaire’ refers to a device for securing answers to questions by using a form which the respondent fills in himself.

The questionnaire has an important place in educational research. It is simple and clear form to get objective results in the best possible way. The questionnaire
was developed and used for collecting the opinions of the person included in the sample for investigation. The study aimed at knowing the degree of acceptance (or) divergence from one’s opinion to others among the individuals in the sample. Considering the flaws and merits of the selection of tools in either way, it was thought that to select a standardized questionnaire as a tool for the present study is more appropriate and suitable. After due consideration of the topic concerned, following tools were used for the study.

3.3.2. Deo & Mohan, Achievement Motivation Scale (2011)

The Achievement Motivation Scale (n-Ach) AMSn-DM was developed and standardized by Prof. Pratibha Deo, Former professor & Head, Depatment of Education, Mumbai University, Mumbai & Dr. Asha Mohan, Retd. Reader, Department of Education, Punjab University, Chandigarh which is published by National Psychological Corporation, Agra. It consists of 50 items as suggested by McClelland and Atkinson. It is standardized on thirteen to twenty years boys and girls.

Need to Develop the Scale: The scale was developed to measure the achievement motivation. Achievement motivation is a variable which is used in many studies in education either as a main or secondary variable or as a moderator variable. This standard verbal scale is found to be a very useful instrument in researches. To prepare the present scale, an effort was made to study factors suitable measuring the achievement motivation. This scale covers three areas such as academic factors, factors of general field and social interests. The scale contains 50 items.

Academic factors: Academic factors include: academic motivation, need achievement, academic challenge, achievement anxiety, importance of grades or marks, meaningfulness of school/college tasks, relevance of school/college to student’s future, attitude towards education, work methods, attitude towards teachers, warmth of interpersonal relations, college concern for the individual, and implementation of educational objectives.

Factors of general field of interest: Competition in co-curricular and curricular activities, Sports and athletics, fine arts and dancing, music, painting, debates and orations, boating, mountaineering or hill climbing or hiking, cross-country races, sports, domestic crafts for girls: cooking, embroidery etc., reading and writing, and experimentation or any act of creation.
**Social interests**: Social interests comprises the activities such as organizing and participating in social activities, arranging exhibitions, social functions etc.

**Criteria for the Choice of Items in the Scale**: The items in the scale evolved achievement imagery related to known achievement experiences of the respondents in comprehensive and accessible language.

Final form of the scale comprised of 50 items having five options for rating that is always, frequently, sometimes, rarely and never, out of which 13 items are negative with numerical values 0 to 4 and 37 items are positive with numerical values 4 to 0 respectively. Description of the items in the scale is shown in the table 3.3.

**TABLE—3.3. Description of the items of Achievement Motivation Scale**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Factor</th>
<th>No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Academic Motivation</td>
<td>4</td>
</tr>
<tr>
<td>2.</td>
<td>Need for Achievement</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Academic Challenge</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Achievement Anxiety</td>
<td>1</td>
</tr>
<tr>
<td>5.</td>
<td>Importance of Grades/Marks</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>Meaningfulness of Task</td>
<td>4</td>
</tr>
<tr>
<td>7.</td>
<td>Relevance of School/College to Future Goals</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>Attitude towards Education</td>
<td>4</td>
</tr>
<tr>
<td>9.</td>
<td>Work Methods</td>
<td>5</td>
</tr>
<tr>
<td>10.</td>
<td>Attitude towards Teachers</td>
<td>3</td>
</tr>
<tr>
<td>11.</td>
<td>Interpersonal Relations</td>
<td>4</td>
</tr>
<tr>
<td>12.</td>
<td>Individual Concern</td>
<td>2</td>
</tr>
<tr>
<td>13.</td>
<td>General Interests</td>
<td>4</td>
</tr>
<tr>
<td>14.</td>
<td>Dramatics</td>
<td>2</td>
</tr>
<tr>
<td>15.</td>
<td>Sports etc.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>
**Reliability**: Test-retest method was applied to obtain the reliability coefficient of the scale. Taking different sets of sample; the administration of the scale was created on several occasions, the results are given in table 3.4 below:

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>Interval</th>
<th>R</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Group</td>
<td>51</td>
<td>4 weeks</td>
<td>0.69</td>
<td>0.01</td>
</tr>
<tr>
<td>Males</td>
<td>33</td>
<td>5-6 Weeks</td>
<td>0.67</td>
<td>0.01</td>
</tr>
<tr>
<td>Females</td>
<td>50</td>
<td>5-6 weeks</td>
<td>0.78</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Validity**: As far as the validity of the scale is concerned, in the first instance the item validity established by the high-low discrimination method was accepted as the validity of the whole measure. Besides, this scale was also used for validating the projective test of achievement motivation. The coefficient of correlation between the scale and the projective test was observed to be .54 which speaks for the validity of the scale also, the validity being of the concurrent nature. Finally, the scale scores were also correlated with the scores obtained by administering the Aberdeen Academic Motivation Inventory of Entwistle (1968) yielding a coefficient of correlation as .75 for a mixed sample of .93.

**Scoring**: Two keys were to be used for scoring, one for positive items carries the weights of 4, 3, 2, 1 and 0 and negative items are to be scored 0, 1, 2, 3 and 4 for the categories of Always, Frequently, Sometimes, Rarely and never respectively. The minimum score obtained can be 0 (zero) and the maximum can be 200, other scores ranging in between these limits.

The specimen copy of the test is given in *Appendix—I*.

**3.3.2. Misra, Learning Style Inventory (2012)**

Learning Style Inventory was developed by Karuna Shankar Misra, Professor & Former Head, Department of Education, Allahabad University, ALLAHABAD, published by National Psychological Corporation, Agra, 2012. This inventory consists of 42 items. It was administered on High School to P.G. Class Students.
This inventory attempts to measure six main learning styles namely—Enactive Reproducing, Enactive Constructive, Figural Reproducing, Figural Constructive, Verbal Reproducing and Verbal Constructive.

There operational definitions are as follows—

1. **Enactive reproducing** : It indicates one’s preference for action based concrete experiences. The emphasis is on imitation and practice. It is reproduction oriented.

2. **Enactive constructive** : It indicates preferences for conceptualizing one’s experiences based on the processing of enactive information.

3. **Figural reproducing** : It refers to one’s preference for visual experiences related to making diagrams, chart, picture, maps and photographs. The emphasis is on imitation and practice. It is reproduction oriented.

4. **Figural constructive** : It refers to the preference for processing of figural experiences which will lead to conceptualizations.

5. **Verbal reproducing** : It refers to written or spoken information related to subject matter communicated through words.

6. **Verbal constructive** : It refers to the reference for reflective, accommodative and abstract thinking about subject matter so as to develop conceptualizations.

The 1 and 2 can be clubbed to as ‘Enactive learning style’, 3 and 4 may be combined to mean ‘Figural learning style’ and 5 and 6 can be combined to mean ‘Verbal learning style’, 1, 3 and 5 taken together mean ‘Reproducing learning style’ while 2, 4 and 6 when combined refer to ‘Constructive learning style’.

**Reliability** : Alpha reliability of the learning style inventory was calculated. Its values for the three learning styles namely—Enactive, Figural and Verbal are .682, .742 and .903 respectively (N=150).

**Validity** : Intrinsic validity of the Learning Style Inventory was found by finding the product moment correlations among learning styles. All the learning styles are positively related to each other.

**Scoring** : There are five response alternatives for each learning behavior. They are—“very much, Much, Normal, Less and Very Less”. These responses are to be scored
by awarding a score of “5, 4, 3, 2 and 1” respectively. Scores on the seven items belonging to each learning style are to be added together to find scores for each of the six learning styles i.e. ER, EC, FR, FC, VR AND VC. Scores on ER and EC are to be added to get the score for ‘Enactive learning style’ (ELS). Scores on FR and FC are to be added to get the score for ‘Figural learning style’ (FLS). Scores on VR and VC are to be added to get the score for ‘Verbal learning style’. Scores on ER, FR and VR can be added to get the score for ‘Reproducing learning style’ (RLS). Scores on EC, FC and VC can be added to get the score for ‘Constructive learning style’ (CLS).

To make scoring easy, the abbreviation of Learning Style has been prefixed before the serial number of each item, viz., ER, EC, FR, FC, VR and VC. The minimum and maximum score on this inventory could be 41 to 210.

The specimen copy of the test is given in Appendix—II.

3.3.3. Chouhan & Arora, The Parental Involvement Scale (2009)

The Parental Involvement Scale (TPIS) was developed by Dr. Vijaya Laxmi Chouhan, Professor & Head, Department of Psychology, College of Social Science and Humanities, M.I.S.U.UDAIPUR (Raj.) & Mrs. Gunjan Ganotra Arora, Counsellor and Psychotherapist, AHMEDABAD (Guj.), published by MANASVI, UG-1, Nirmal Height, Mathura Road, AGRA, 2009. This scale consists 25 items in three area—connection, monitoring and psychological autonomy. It is standardized on the ages of thirteen to eighteen years old adolescents.

The scale is suitable to measure involvement of parents in their children’s life and education. This scale is a resource to study, research or survey the adolescent population and to prepare and plan future interventions for them. It can be useful for psychologists, counsellors, educationist in their specific areas of work, to understand adolescents and also plan social or family level programmes to enhance adolescents’ development.

The total 25 statements comprise of both positive and negative statements. (14 positive and 11 negative statement). This scale is a five- point scale. The items can be responded to by choosing from options; always, often, sometimes, rarely and never. The minimum score on the scale is 25 and the maximum score is 125. The scoring of the positive and negative statements is done from 5 to 1 and 1 to 5 respectively as below in table 3.5.
TABLE—3.5. Scoring of the positive and negative statements of The Parental Involvement Scale

<table>
<thead>
<tr>
<th>Statement Type</th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Statements</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Negative Statements</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

After the computation of the total scores the percentile ranks are calculated and interpreted as very low, low, average, high or very high perceived parental involvement.

**Reliability** : The reliability of the test was calculated for the entire length of the scale on a sample of 100 adolescents (boys and girls), aged 13-18 years. The split half method was used and the split half reliability coefficient found to be 0.92.

**Validity** : All the statements on the scale are clearly concerned with the study variable, thus face validity is confirmed. The validity of the research tool was calculated by the product moment method and was found to be 0.85.

The specimen copy of the test is given in Appendix—III.

3.3.4. S.S.E. Test of Academic Achievement

To measure the academic achievement of tenth standard secondary students, the marks of Haryana Board of Secondary School Examination, HBSE were taken. The reason for taking these marks is that this examination is the immediate examination after conducting Achievement Motivation Scale, Learning Style Inventory and Parental Involvement Scale.

3.3.5. Socio Demographic Data Sheet

The data sheet was carefully prepared by the investigator herself after going through an extensive related literature. This elicits information regarding, class, age, medium of education, father’s education, father’s occupation, mother’s education, mother’s occupation, type of school, size of the class, tuition, ordinal position, academic background of the family, gender, chronic physical ailments, type of family, religion, number of siblings, residential area, grandparent’s role, family environment, school environment, co curricular activities, meta cognition, parental expectation, role of parent teacher association, and parental interaction of each individual student. All these factors were found either necessary or relevant for the present investigation.

The specimen copy of the test is given in Appendix—IV & V.
3.4. DATA COLLECTION

The purpose of the present study, as mentioned earlier, was to explore the influence of achievement motivation, learning style and parental involvement on the academic achievement of the secondary school students in Haryana. The data collection was done by administering all the four tools to the secondary school students by visiting the schools personally and taking permission from the Principals of the schools. In each school, students were selected randomly from the class. After establishing a rapport with the students all the instruments were administered to the students. The students were instructed properly to give responses. To obtain students’ academic achievement, board examination marks (percentage) held in March 2012-13 were considered. The filled in questionnaires/answer sheet were collected from each respondents. The scoring was done strictly according the directions and instructions given in the respective test manuals.

3.5. STATISTICAL TOOLS

The data collected were consolidated coded, scored and entered into electronic spreadsheet for statistical analysis, using software packages MS-EXCEL and SYSTAT. Standard statistical procedures of the descriptive and inferential statistics were employed for the analysis of the data. Statistical techniques employed for the present study were Descriptive statistics, Pearson product - moment coefficient of correlation, t-test statistics and regression analysis.

3.5.1. Descriptive Statistics

(i) **Mean**: The mean of a distribution is commonly understood as the arithmetic average. The term grade-point average is a mean value. It is computed by dividing the sum of all the scores by the number of scores.

(ii) **Standard Error**: The standard deviation of the distribution of a statistic is known as its *Standard Error*, abbreviated as S.E. The magnitude of the standard error gives an index of the precision of the estimate of the parameter. The reciprocal of the standard error is taken as the measure of reliability or precision of the sample.

(iii) **Median**: Median of a distribution is the value of the variable which divides it into two equal parts. It is the value which exceeds and is exceeded by the same number of observations i.e., it is the value such that the number of observations above it

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is equal to the number of observations below it. The median is thus a positional average.

(iv) **Mode** : Mode is the value which occurs most frequently in a set of observations and around which the other items of the set cluster densely. In other words, mode is the value of the variable which is predominant in the series.

(v) **Standard Deviation (S.D.)** : It is a measure of spread or dispersion of scores in a distribution. It is also known as the square root of the variance.

(vi) **Skewness** : Literally, skewness means ‘lack of symmetry’. Skewness is studied to have an idea about the shape of the curve which can be drawn with the help of the given data. A distribution is said to be skewed if

A. Mean, median and mode fall at different points,

B. Curve drawn with the help of given data is not symmetrical but stretched more to one side than to the other.

The skewness can be positive as well as negative. The skewness is positive if the large tail of the distribution lies towards the higher values of the variate, i.e., if the curve drawn with the help of the given data is stretched more to the right than to the left and is negative in the contrary case.

(vii) **Kurtosis** : Kurtosis enables us to have an idea about the flatness or peakedness of the curve. A curve which is neither flat nor peaked is said to be normal curve or *mesokurtic curve*. A curve which is flatter than the normal curve is known as *platykurtic* and a type of curve which is more peaked than the normal curve is called as *leptokurtic*.

(viii) **Range** : The range is the difference between two extreme observations of the distribution.

3.5.2. Pearson product-moment coefficient of correlation

Correlation is the relationship between two or more paired variables or two or more sets of data. The degree of relationship is measured and represented by the coefficient of correlation. Positive correlation specifies that for every unit increase/decrease in one variable there is a proportional unit increase/decrease in the other. When a large amount of one variable
is associated with a small amount of the other that is for every unit increase/decrease in one
variable there is a proportional unit decrease/increase in the other, it is negative correlation.
When the relationship between two sets of variables is a pure chance relationship, there is no
correlation (Best & Kahn, 2005, p. 364).

Correlation coefficient is a single number that represents the degree of relationship
between two variables. It can range in value from -1.00 to +1.00. A correlation coefficient
of -1.00 indicates that there is a perfect negative relationship between the two variables
of interest. A correlation coefficient of +1.00 indicates that there is a perfect positive
relationship between the two variables of interest. A zero correlation means that there is
little or no relationship between the two variables (Smith & Davis, 1997, p. 187). The
correlation coefficient is a statistical tool that can be used to compare measurements taken on
2 different variables in order to determine the degree of relationship between these variables
(Chandrasekaran & Karthikeyan, 2004, p. 60).

When the data for both variables are expressed in terms of quantitative scores, the
Pearson ‘r’ is the appropriate correlation coefficient to use (Fraenkel & Ille, 2006, p. 209).
The strength and direction of a correlation are determined by the calculation of the correlation
coefficient, or ‘r’ (Elmes, Kantowitz, & Roediger, 2006, p. 369).

When both the sets of scores to be correlated are continuous, a Pearson product-moment
coefficient (r) is a widely-used statistic (Sommer & Sommer, 1997, p. 279).

The Pearson’s product – moment correlation was used to find correlation between
variables in present study. It is denoted by lower case letter ‘r’.

3.5.3. t-test Statistics

The test of the significance of the difference between two means is known as t-test (Best
& Kahn, 2004, p. 328). t-test is based on t - distribution and is considered an appropriate test
for judging the significance of a sample mean or for judging the significance of difference
between the means of two samples in case of small sample(s) when population variance is
not known (in which case variance of the sample as an estimate of the population variance is
used. In case two samples are related, paired t – test or difference test is used for judging the
significance of the mean of difference between the two related samples (Kothari, 2008, p.196).

In t-test is used for testing the significance of the difference between means by taking two
means at a time (Mangal, 2007, p. 319).
3.5.4. Multiple Regression

In multiple regression, a linear composite of explanatory variables is formed in such a way that it has maximum correlation with criterion variable. The technique is appropriate when there is a single metric criterion variable, which is supposed to be a function of other explanatory variables. The main objective in using this technique is to predict the variability of the dependent variable based on its covariance with all the independent variables. Using the regression analysis model, the scores on the dependent variable can be predicted based on the scores on the independent variables. The analysis results in a regression equation having the general formula \( Y = B_1 X_1 + B_2 X_2 + \ldots + B_k X_k + A \), where \( B_1, B_2, \ldots, B_k \) are the regression coefficients (beta weights), \( X_1, X_2, \ldots, X_k \) are the predictor variables, and \( A \) is a constant representing the value of the intercept in \( Y \) the axis.

In the present study, multiple regression analysis was conducted using academic achievement (marks) as dependent variables and the other study variables as independents, with a view to find out the extent to which academic achievement could be predicted on basis of the entire set of variables considered in the present study. It is also noteworthy here that multiple regression procedure provides opportunity to control for multivariate interactions among the entire set of variables and estimate the unique contributions of different predictors retained in the final regression equation.