Chapter-III

DESIGN OF RESEARCH

This chapter is divided into two sections.

(A) Design of the Study
(B) Descriptions of Tools

SECTION-A

3.1 DESIGN OF STUDY

“A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.” In fact, the research design is the conceptual structure within which research is conducted, it constitutes the blueprint for the collection, measurement and analysis of data. Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used for their analysis keeping in view of the research objectives.

Design of the study is an essential part of a research project. Because design provides a picture of what and how to do the work before starting. It has been determined from time to time that a suitable research design guards against the collection of irrelevant data and grate more economy. So in any research project, design provides the researcher a blueprint of research which dictates the boundaries of project and helps in controlling the experimental, extraneous error, variances of the problem under investigation etc.

This is a correlation study. It correlates academic achievement with study habit, home environment and school environment.

The present chapter describes the design or plan of the study and highlights the details about the research procedure followed in conducting the study. As such, it is an important part of the research study and needs to be planned and carried out
systematically to arrive at accurate judgements. It includes information about the population, the sample frame, the nature and form of data collection, tools, methods of collecting data and statistical techniques used for analysis of data etc. In order to achieve the objectives and the stated corresponding hypotheses the following plan of the study has been followed.

3.2 METHOD

Researches in the field of academic achievement have employed different methods of study for investing different relationships. Method of research is also determined by the theory and objectives of the problem to be studied. The problem to be investigated for the present study concerns with academic achievement of scheduled caste secondary school students in relation to their home environment, school environment and study habits.

The descriptive survey method is used in the present investigation. It describes the current position of the research work. It involves interpretation, comparison, measurement, classification, evaluation and generalization. All these direct towards a proper understanding solution of significant educational problem.

3.3 SAMPLE

Sampling is very important and crucial part of behavioural research. It is indispensable to educational research. The research work cannot be undertaken without the selection of sample. The study of entire target population is practically not possible. Cost, time and other factors come in the way of studying of the total target population. Sampling makes the research feasible within the available resources. David S. Fox (1969) remarks, “It is not possible to collect data from every respondent relevant to our study, but only from some fractional part of the respondents. This process of selecting the fractional part is called sampling.” Population involved all the scheduled caste students of X class of three districts of Haryana. Further thirty schools were selected randomly. All the scheduled caste students of secondary class were taken. A sample of 600 students present during the administration of the tests in the institutions was thus selected.
Table 3.1
Sample schools of three districts

<table>
<thead>
<tr>
<th>Districts</th>
<th>No. of schools</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rohtak</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>Jhajjar</td>
<td>10</td>
<td>200</td>
</tr>
<tr>
<td>Jind</td>
<td>10</td>
<td>200</td>
</tr>
</tbody>
</table>

Students of both the sexes were included in the sample. Each school was selected randomly by lottery system and all the students studying in these institutions were taken as a cluster without any bias of extraneous factors such as suitability of school, number of students and the distance from the residence of place of work etc. In this way random cluster sampling technique was used for the study. The sample students were further classified into low achievers (below average) and high achievers (above average) on the basis of Mean ± 1σ.

FIGURE 3.1: LAYOUT OF SAMPLE
Fig. 3.2  Layout of Sample

The sample students were further classified into low achievers (below average) and high achievers (above average) on the basis of Mean ± 1 \( \sigma \).

**FIGURE 3.3  LAYOUT OF TYPES OF ACHIEVERS**
3.4 VARIABLES USED IN THE STUDY

There are three independent variable and one dependent variables in this study which are as under:

(A) Independent Variable
1. Home Environment
2. School Environment
3. Study Habits

(B) Dependent Variable
1. Academic Achievement
3.5 TOOLS

The following tools were used for collecting data for the study
1. Study Habit Inventory by Dr. M. Mukhopadhyay and Dr. D.N. Sansanwal.
2. Home Environment Inventory (HEI) developed by Dr. K.S. Mishra
3. School Environment Inventory (SEI) developed by Dr. K.S. Mishra.
4. 10th Class Board Examination scores of scheduled caste secondary school students were taken as academic achievement.

Before collection of data with the help of various tools, a pilot study was conducted to find its suitability and appropriateness of tools. The test was administered on sample of 50 students of 10th class taken randomly from the institution selected randomly. Its procedure adopted to check reliability and validity of inventory, investigator used split half method. The reliability was found 0.96, which was very near to the reliability of study habit inventory. The reliability coefficient was also approximately same in home environment inventory and school environment inventory which indicates that the inventory is reliable in the present context.

3.6 PROCEDURE OF DATA COLLECTION

For the purpose of collecting data, the permission of Heads and Principal was dully sought. Before the administration of the tools, the purpose of the study was explained to them well in advance orally so that they may direct the students and teachers to come with frank and fair mind. Researcher took permission in written duly signed by the concerned authorities.

The investigator requested the Principals of the sample schools to grant permission to conduct the work. Before the collection of data in each sample school, one day spent in rapport establishment with the students. The objectives of the tests were explained to the students. They were taken into confidence that these tests will not affect in any way their annual results and the answers given by them will be kept confidential. They were also told to extend their imagination and practice free
thinking while taking these tests. The help of the concerned teacher was solicited to enlist the responses from the respondents and for proper administration of the test.

After rapport establishment, the next day the first inventory of study habit was administered. Before administration of the test, it was ensured that all the students were at ease. They were briefed about the test and the instruction to be followed. The third day Home Environment Inventory was administered to them and fourth day School Environment Inventory was conducted. The instructions given in the tests were strictly followed to get fruitful results. After completion of each test, they were thanked for their cooperation. One day was spent in each sample institution to collect the academic achievement in the form of the marks obtained in secondary examination. This scheme was followed in all the sample institutions. Thus the required data was collected from each school.

3.7 STATISTICAL TECHNIQUES USED

Keeping in view the objectives as well as design of the study, coefficient of correlation and ‘t’ test were used for the analysis of the data. Pearson’s Coefficient of correlation were computed to analyze the relationships. Mean, Standard Deviation and ‘t’ test were used to find the significance of difference between the means.

SECTION – B
(DESCRIPTIONS OF TOOLS)

3.8 DESCRIPTION OF STUDY HABIT INVENTORY (SHI)

Study habit as a research variable in Indian researches, has been investigated in two ways. One group of studies treated it as the dependent variable-measured it and also studied several other variables as its correlates. Rarely, any researcher predicted study habit by another set of variables. The second and the major group of researchers studied study habit as a correlate or predictor of certain other criterion variables-academic achievement is the most common among them. In fact, the study habit is a very important characteristics of all human beings who are ‘being educated’ and ‘are educated’. As much study habit is important for higher academic achievement of the students. So much it is important for their fruitful use of leisure time. The later aspect is also important for adults who are now in the job,
particularly for the teachers. Thus ‘study habit’ as a habit is generic rather than specific in terms of its importance. It has very long reaching effects deep into the life of individuals.

While one can and usually does presume a delta point in the life of an individual whereby the study habits get fixed by certain age, possibly such patterns get fixed only in over behaviours like study sets, drilling etc. The covert behaviours, like concentration, comprehension, task orientation change with each important changes in the life stages. This instrument was designed to measure the study habits of students.

CONSTRUCTION

In constructing an inventory, the basic issue centres around the constructs of the behaviour to be measured. For the present inventory, the study habits have been considered to be constituted on nine different kinds of study behaviours. These are:

(I) COMPREHENSION:

There are certain specific behaviours with respect to a student’s study behaviour which are geared to better comprehension. For example, before reading a lesson intensively the student may try to catch on what the lesson is about. By so doing, he may actually try to establish a mental set for studying a particular content. Similarly, he may try to relate the materials learned in one subject with those learned in another, so that he may subsume the new learning with the previous knowledge.

(II) CONCENTRATION:

Concentration is a very important predictor of effective study habits. Some students are capable of concentrating easily and for long whereas, some others take time to concentrate, but once they concentrate, they can continue for long, while still some others find it difficult to concentrate at all. Some may read only when they are in mood to do so. Others may require stimulations through tea, coffee, smoking etc. for concentration.
(III) TASK ORIENTATION:
If a student who has to study a series of subjects and has to develop different levels of cognition, the task orientation is an important component of the study habits. For example, some students study different subject according to the fixed routine – daily, weekly or monthly. Certain students fix the time target for completing certain academic tasks. Students’ orientations and behaviours towards accomplishment of the tasks in a pre-decided time frame is task orientation.

(IV) STUDY SETS:
By study sets we mean the physical and situational characteristics which a student adopts for study. For example, some students read only in the night; some students learn more when they read lying on the bed, whereas some others may as well sleep if they read lying on the bed.

(V) INTERACTION:
Although both teaching and learning in our colleges have remained convocation and almost the private affair of the particular teachers or students respectively, there is enough evidence to conclude that interaction of a student with his teachers or parents or his friends contributes positively towards better learning. Thus, interaction is a significant component of study habit. For example, when a student does not understand while studying, he may go to some of his friends for a discussion. Amongst the postgraduate students in certain universities, a common practice is to form small groups of three or four students who study together.

(VI) DRILLING:
Drilling means practicing a particular learning again and again. While drilling is a common practice at school level, it is a very important component of good study habits amongst students of science and technology. Since drilling is almost essential in case of learning of Mathematics, Chemistry, Engineering, Drawing etc. These students may revise the topics and tasks already learned more than once.
(VII) SUPPORTS:
Study in any particular discipline gets a sound back-up from a broader study base. A student’s habit of studying different types of books, other than textbooks, or newspapers and magazines may be helpful in the learning of his subjects.

(VIII) RECORDING:
At higher level any good teacher hardly teaches on the basis of a single book. For good performance of the students, it is also necessary to read a number of books; recording in the form of text, class notes or preparing one’s own study notes are, hence, very important factors. Some students prepare their independent study. Many students depends only on the class notes dictated by the teacher.

RELIABILITY:
The reliability of the whole inventory was worked out by using split-half method. The reliability coefficient is .91 which is fairly high and indicates that the inventory is reliable.

SCORING PROCEDURE:
The inventory comprises 52 items pertaining to line sub-components namely Comprehension (12 items), Concentration (10 items), Task Orientation (9 items), Study Size (7 items), Interaction (3 items), Drilling (4 items), Supports (4 items), Recording (2 items) and Language (1 items) which characterize the basis of study habits. The items have been drafted in affirmative (34 items) and negative (18 items) forms.

AFFIRMATIVE (+) ITEMS:
1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 22, 23, 24, 25, 27, 29, 30, 31, 32, 34, 38, 39, 41, 43, 44, 46, 49, 50, 51, 52 (34 items)

NEGATIVE (-) ITEMS:
10, 16, 17, 18, 19, 20, 21, 26, 28, 33, 35, 36, 37, 40, 42, 45, 47, 48 (18 items). The scoring guide given in the last page of consumable booklet on the inventory clearly stipulates that a positive item should be given 4, 3, 2, 1 and 0 for responses ‘always’, frequently’, ‘sometimes’, ‘rarely’ and ‘never’ respectively,
whereas the scoring process should be reversed as 0, 1, 2, 3 and 4 for negative items.  
Maximum Total Score 208 and Minimum Total Score 0.  
Positive Items – 4, 3, 2, 1, 0  
Negative items – 0, 1, 2, 3, 4

3.9 DESCRIPTION OF HOME ENVIRONMENT INVENTORY (HEI)

Human beings are always immersed in a social environment which not only changes the very structure of the individual or just compels him to recognize facts but also provides him with a ready-made system of signs. It imposes on him a series of obligations. Two environments namely, home and school environments, share an influential space in child’s life. Family is the social-biological unit that exerts the greatest influence on the development and perpetuation of the individual’s behaviour. The psychological atmosphere of a home may fall into any of the four quadrants, each of which represents one of the four general combinations: acceptance – autonomy, acceptance – control, Rejection- autonomy and rejection-control (Johnson & Medinnus, 1969), Grebow (1973) reported that ‘nurturance-affection’ and ‘achievement expectations, demands and standards’ constitute the two dimensions of parental behaviour that have been regarded as important by previous researchers. Various researchers have identified the following characteristics of home environment or parental child rearing practices permissiveness, willingness to devote time to the child, parental guidance, parental aspiration for achievement, provisions for the child’s intellectual needs, affective rewards, instrumental companionship, prescription, physical punishment, principled discipline, neglect, deprivation of privileges, protectiveness, power, achievement demands, indulgence, conformity, independence, emotional and verbal responsivity, involvement with the child, physical and temporal environment, avoidance of restriction and punishment, provision of appropriate play materials, etc. There exists a great overlapping in the kinds of behaviours which are in association with different characteristics.

The present Home Environment Inventory (HEI) is an instrument designed to measure the psycho-social climate of home as perceived by children. It provides a measure of the quality and quantity of the cognitive, emotional and social support
that has been available to the child within the home, HEI has 100 items belonging to ten dimensions of home environment. Operational definitions of these dimensions are as follows:

A. **CONTROL**: It indicates “autocratic atmosphere in which many restrictions are imposed on children by the parents in order to discipline them”.

B. **PROTECTIVENESS**: It implies “Prevention of independent behaviour and prolongation of infantile care”.

C. **PUNISHMENT**: It includes “Physical as well as affective punishment to avoid the occurrence of undesirable behaviour.

D. **CONFORMITY**: It indicates “Parent’s directions, commands, or orders with which child is expected to comply by action”. It refers to “Demands to work according to parent’s desires and expectations”.

E. **SOCIAL ISOLATION**: It indicates “Use of isolation form beloved persons except family members desires and expectations”.

F. **REWARD**: It includes “Material as well as symbolic rewards to strengthen or increase the probability of desired behaviour”.

G. **DEPRIVATION OF PRIVILEGES**: It implies “Controlling children’s behaviour by depriving them or their rights to seek love, respect and childcare form parents”.

H. **NURTURANCE**: It indicates “Existence of excessive unconditional physical and emotional attachment of parents with the child. Parents have a keen interest in and love for the child”.

I. **REJECTION**: It implies “Conditional love recognizing that the child has no rights as a person, no right to express his feelings, no right to uniqueness and no right to become an autonomous individual”.

J. **PERMISSIVENESS**: It includes “Provision of opportunities to child to express his views freely and act according to his desires with no interference form parents”.

HEI Contains 100 items related to ten dimensions of home environment. The ten dimensions are – (A) Control, (B) Protectiveness, (C) Punishment, (D) Conformity, (E) Social Isolation, (F) Reward, (G) Deprivation of Privileges, (H)
Nurturance, (I) Rejection, and (J) Permissiveness. Each dimension has ten items belonging to it.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Dimensions</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Protectiveness</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Punishment</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Conformity</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Social Isolation</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Reward</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Deprivation of Privileges</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>Nurturance</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>Rejection</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>Permissiveness</td>
<td>10</td>
</tr>
</tbody>
</table>

The instrument requires pupils to tell the frequency with which a particular parent-child interaction behaviour has been observed by them in their homes, i.e. he/she is requested to tell whether a particular parental behaviour (as mentioned in an item) Occurs - ‘Mostly’, (cqg/kk) ‘Often’, (izk;) ‘Sometimes’, (dHkh&dHkh) ‘Least’, (cqqr de) and ‘Never’, (dHkh ugha)

**ADMINISTRATION OF THE INVENTORY:**

Home Environment Inventory (HEI) can be administered in individual or group settings. To start with, students should be made familiar with the nature and purpose of measurement of home environment. Later, the procedure for marking the responses on the booklet should be explained to them. They should be asked to put ‘x’ mark on any cell indicating their perception of the frequency with which a particular behaviour has been exhibited by their parents.

Students should feel assured about the confidential nature of their responses. At the time of administration in group setting, the space between individuals should be adequate so that other students may not guess about the response made by another student against a particular item. Students should be allowed to omit items which they find difficult or impossible to respond. This should be treated as a symbol of individual’s tendency to give socially desirable responses. For research
purposes, the scores of such students should not be used unless interviewing or any other technique is used to ensure the validity of their responses.

SCORING THE RESPONSES TO HEI ITEMS:

The responses are to be given on the booklet itself. There are five cells against every item of the inventory. Each cell indicates the frequency of occurrence of a particular behaviour. The five cells belongs to five responses namely, ‘Mostly’, (cggkk) ‘Often’, (izk;) ‘Sometimes’, (dHkh&dHkh) ‘Least’, (cgqr de) and ‘Never’, (dHkh ugha). The dimension to which a particular item belongs has been indicated by alphabets near the serial number of the items. Assign 4 marks to ‘mostly’, 3 marks to ‘often’, 2 marks to ‘sometimes’, 1 mark to ‘least’, and 0 marks to ‘never’ responses. Count the marks assigned to A, B, C, D, E, F, G, H, I, and J dimension-Statements on every page and then add the dimension-scores awarded to statements given on the five pages so as to get scores for the ten dimensions of HEI.

RELIABILITY:

The ‘Home Environment Inventory’ was administered to 113 students (54 boys and 59 girls) studying in intermediate classes of five schools. Split half reliabilities were worked out separately for all the ten dimensions of home environment. The split-half reliabilities (Corrected for length) for various dimensions of home environment are as follows:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Inventory Dimensions</th>
<th>Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Control</td>
<td>.879</td>
</tr>
<tr>
<td>B</td>
<td>Protectiveness</td>
<td>.748</td>
</tr>
<tr>
<td>C</td>
<td>Punishment</td>
<td>.947</td>
</tr>
<tr>
<td>D</td>
<td>Conformity</td>
<td>.866</td>
</tr>
<tr>
<td>E</td>
<td>Social Isolation</td>
<td>.870</td>
</tr>
<tr>
<td>F</td>
<td>Reward</td>
<td>.875</td>
</tr>
<tr>
<td>G</td>
<td>Deprivation of Privileges</td>
<td>.855</td>
</tr>
<tr>
<td>H</td>
<td>Nurturane</td>
<td>.901</td>
</tr>
<tr>
<td>I</td>
<td>Rejection</td>
<td>.841</td>
</tr>
<tr>
<td>J</td>
<td>Permissiveness</td>
<td>.726</td>
</tr>
</tbody>
</table>
VALIDITY:

Home Environment Inventory has been found to possess content validity as measured with the help of views expressed by judges. Criterion-related validity could not be established because of the lack of appropriate external criteria.

3.10 ESCRIPTIO OF SCHOOL ENVIRONMENT INVENTORY (SEI)

Human beings are always immersed in a social environment which not only changes the very structure of the individual or just compels him to recognize facts but also provides him with a readymade system of signs. It imposes on him a series of obligations. Two environments—home and school—share an influential space in child’s life and there exists a unique juxtaposition between the two (Tucker & Bernstein, 1979). According to Sagar and Kaplan (1972), by its very nature, the family is the social-biological unit that exerts the greatest influence on the development and perpetuation of the individual’s behavior. Next to family, the school is the most important experience in the process of child development. When the child enters the school area, he or she is presented with new opportunities in terms of socialization and cognitive development. These opportunities are provided in different measures in different schools and may have a direct impact on the cognitive and affective behaviors of students. The nature of this impact can be understood if we devote our research energies to find out the environment variables that are most effective in promoting optimum development of each child’s potentialities.

The present ‘School Environment Inventory (SEI) is an instrument designed to measure the psycho-social climate of schools as perceived by the pupils. It provides a measure of the quality and quantity of the cognitive, emotional and social support that has been available to the students during their school life in terms of teacher-pupil interactions. SEI has items belonging to six dimensions of the school environment. Operational definitions of these dimensions are as follows:

A. **CREATIVE STIMULATION**: It refers to “teacher’s activities to provide conditions and opportunities to stimulate creative thinking.”
B. **COGNITIVE ENCOURAGEMENT**: It implies “teacher’s behaviour to stimulate cognitive development of student by encouraging his actions or behaviours.”

C. **PERMISSIVENESS**: It indicates “a school climate in which students are provided opportunities to express their views freely and act according to their desires with no interruption from teachers.”

D. **ACCEPTANCE**: It implies “a measure of teacher’s unconditional love, recognizing that students have the right to express feelings, to uniqueness and to be autonomous individuals. Teachers accept the feelings of students in a non-threatening manner.”

E. **REJECTION**: It refers to “a school climate in which teachers do not accord recognition to students’ rights to deviate, act freely and be autonomous persons.”

F. **CONTROL**: It indicates “autocratic atmosphere of the school in which several restrictions are imposed on students to discipline them.”

SEI contains 70 items related to the six dimensions of school environment i.e. concepts intuitively judged relevant to the social psychology of the classroom. The six dimensions are – (A) Creative Stimulation (CRS), (B) Cognitive Encouragement (COE), (C) Permissiveness (PER), (D) Acceptance (ACC), (E) Rejection (REJ), and (F) Control (CON). Twenty items belong to the (CRS) dimensions while each of the remaining five dimensions has ten items belonging to it.

The instrument requires pupils to tell the frequency with which a particular teacher pupil interaction behaviour is expressed in his or her school i.e. he/she is requested to tell whether a particular teacher-behaviour (as mentioned in an item) occurs – ‘Always’, ‘Often’, ‘Sometimes’, ‘Rarely’ and ‘Never’.

There is no time-limit for this tool.

**SCORING THE RESPONSE TO SEI ITEMS:**

The responses are to be given on the booklet itself, against each item of the inventory five alternatives are given in forms of cells indicating the intensity of the responses. Assign 4 marks to ‘Always’, 3 marks to ‘Often’, 2 marks to ‘Sometimes’,
1 marks to ‘Rarely’ and zero to never responses. The particular item belongs to which area is indicated by alphabets near the serial no.

RELIABILITY:

The ‘School Environment Inventory’ was administered to 113 students (54 boys and 59 girls) studying in intermediate classes of five schools situated in city areas of Agra and Mainpuri. The split-half reliabilities (corrected for length) for various dimensions of the school environment are as follows:

<table>
<thead>
<tr>
<th>Scale-dimension</th>
<th>Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) Creative Stimulation</td>
<td>.919</td>
</tr>
<tr>
<td>(B) Cognitive Encouragement</td>
<td>.797</td>
</tr>
<tr>
<td>(C) Acceptance</td>
<td>.823</td>
</tr>
<tr>
<td>(D) Permissiveness</td>
<td>.673</td>
</tr>
<tr>
<td>(E) Rejection</td>
<td>.781</td>
</tr>
<tr>
<td>(F) Control</td>
<td>.762</td>
</tr>
</tbody>
</table>

VALIDITY:

School environment inventory has been found to possess content validity as measured with the help of views expressed by judges. Because of the lack of appropriate external criteria, criterion-related validity could not be established. During its shorts history, the inventory has been used in four research studies.