Chapter - III

Method of the Study...
CHAPTER III

METHOD OF THE STUDY

The research problem, theoretical construct of variables, the review of related studies, objectives, hypotheses and the description of tools were discussed in the preceding chapters. The present chapter has been devoted to the method of the study which focuses around the procedure of the study.

To carry out any research investigation, it is necessary to adopt a systematic method and procedure. Methodology covers the design of the research, selection of the representative sample, applying appropriate research tools and techniques, collecting relevant data and its analysis. The selection of appropriate method depends upon purpose of the study, nature of the problem and kinds of data necessary for its study. The main purpose of this is to provide details regarding:

- Tools used
- Sample
- Design of the study
- Procedure of the study
- Statistical techniques used.

3.1 Tools used

A keen attention should be given for selecting the data gathering tools.

The following tools were used for collecting data:

- Achievement test: (Developed and validated by the investigator).
- Parental Involvement Scale: Developed and standardized by Ahuja, M. and Sharma, N (2002).
- Specification of objectives along various categories of Bloom’s Taxonomy.
  (Specified by the investigator himself)
3.2 Sample

The adequacy of a sample i.e. its lack of bias, depends upon our knowledge of the population as well as the method used in drawing the sample. Population refers to all cases under investigation and a sample is an actual subset of observations drawn from a population (Calfee, 1975). A population is the theoretical set of all possible observations for a particular experiment (Calfee, 1975). If the observations are numbers, then the population is described by the distribution function of the observations, which gives the probability of occurrence for each possible numeral value. In statistical terminology, the items that make up a test constitutes a sample from a much larger collection or population of items that might have been used in that test (Ebel, 1979).

The sample can thus be described by a distribution of proportions propelling the probability distribution of function. The sampling distribution can be thought of as the result of repeating a sampling operation many times with a fixed sample size, and calculating a statistic from each sample. At the same time, the sampling distribution of statistics gives us a way of relating the sample estimate to the population parameter. It provides a way of determining the significance level of a given result under the null hypothesis (Garrett, 1981; Ebel, 1979; and Lomax, 2001).

The size of the population places an upper limit on the size of the sample that can be drawn from it (Ebel and Frisbie, 1991). The sample cannot be larger than the population (Calfee, 1975; Ebel and Frisbie, 1991; and Robson, 1996). The larger the population, the more likely it is to be heterogeneous, i.e. to include diverse and semi-independent areas of knowledge or ability. In order to achieve equally accurate results, a somewhat larger sample is required in a heterogeneous domain than in a homogeneous domain (Robson, 1996). A large sample will always yield a sample statistics closer to the population parameter than a more limited sample (Garrett, 1981). The larger the sample, the smaller the sampling errors are likely to be and such errors are not caused by mistakes in sampling (Ebel and Frisbie, 1991).

A sampling procedure is representative if every sub-class eventually occurs with the same proportion in the sample as in the general population (Garrett, 1981). In probability sampling, statistical inferences about the population can be made from the respondents of the sample. It is therefore sometimes referred to as the
representative sampling (Robson, 1996), where the sample is taken as a representative of the population (Garrett, 1981).

Various techniques have been devised for obtaining sample, which will be representative of its population. Most commonly used sampling techniques are:

- Random sampling
- Stratified or quota sampling
- Incidental sampling, and
- Purposive sampling

The descriptive term random is often misunderstood. Random sampling means that we rely upon a certain technique of selection called random to provide an unbiased cross section from the larger group or population. Thus, random sampling:

- yields samples that are representative of the population and that are free of systematic bias.
- avoids systematic bias, which generally occurs when there is a non random selection procedure (i.e. a person is assigned to be in a condition depending on his particular characteristics).
- ensures that for any sample of subjects, there is no bias in assigning any person to any particular treatment group.

The criteria for randomness are met when:

- Every individual in the population of supply has the same chance of being chosen for the sample; and
- The selection of one individual of thing in no way influences the choice of another.

The sample in the present investigation was drawn at two levels:

- The school sample
- The student sample

3.2.1 The school sample

The School sample was drawn from the secondary schools of Chandigarh. A list of schools was procured from the District Education Office. Then by random sampling the three schools were selected. For random sampling the name of all the schools were written down on separate sheets of paper of equal size. The papers were
folded into six symmetrical slips and put in a carton box. The lid was then sealed and
the box was shaken up many times for easy shuffling to take place. The investigator
drew out three slips one by one baring the names of each school.

The draw of school included following school:

- Shishu Niketan School, Sector-22 D, Chandigarh.
- Shivalik Public School, Sector-41 D, Chandigarh.
- Government Model Senior Secondary School, Sector-10, Chandigarh.

All the schools were equal on the basis of their intake procedures, standard of
education reputation and all are affiliated to Central Board of Secondary Education.

3.2.2 The student sample

The Principals of these schools were approached and all the three Principals
welcomed the idea and promised to cooperate very enthusiastically. It was ensured
that none of these schools done ability grouping and students are randomly assigned
to each section. Hence, two sections were randomly selected from each of these four
schools. The distribution of initial sample has been presented in the table 3.1.

Table 3.1. Showing school wise distribution of the initial sample

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of the School</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shishu Niketan School, Sector-22 D, Chandigarh</td>
<td>89</td>
</tr>
<tr>
<td>2.</td>
<td>Shivalik Public School, Sector-41 D, Chandigarh</td>
<td>91</td>
</tr>
<tr>
<td>3.</td>
<td>Government Model Senior Secondary School, Sector-10,</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Chandigarh</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>275</td>
</tr>
</tbody>
</table>

3.2.3 The final sample

The total process of study lasted about two months. Hence, there were some
dropouts in the sample because of absence at one or the other stage. These students
were therefore dropped at the time of analysis. The final sample on which the analysis
was done have been presented in the table 3.2.
Table 3.2. Showing school wise distribution of the final sample

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Name of the School</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shishu Niketan School, Sector-22 D, Chandigarh</td>
<td>84</td>
</tr>
<tr>
<td>2.</td>
<td>Shivalik Public School, Sector-41 D, Chandigarh .</td>
<td>86</td>
</tr>
<tr>
<td>3.</td>
<td>Government Model Senior Secondary School, Sector-10, Chandigarh</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>260</td>
</tr>
</tbody>
</table>

3.2.4 Controls of selecting sample

Control Variables

One of the main contestants in every empirical study is that conclusions always have to be inferred from observation (Norton, 1952; De-klerk, 1979). Identification and control of relevant variables are two of the most critical tasks confronting most researchers (D’Amato, 1970). Although the control of known or potentially relevant variables is often not difficult to accomplish, then identification frequently requires insight and ingenuity (Church, 1964; Rescorla, 1967; Solomon and Lessac, 1968; Seligma, 1969). The matter of detecting unrecognized relevant variables rests entirely within the experimenter’s perceptiveness (Solomon and Lessac, 1968). The reason for experimenter wishes to control known and potentially relevant variables is to avoid repetition and contamination (Seligma, 1969). One goal of experimental research is to determine how the independent variables of the study effect the dependent variables (D’Amato, 1970). Most control measures fall into one of the three general types of control techniques: Matching, Randomization and Counterbalancing.

In matching techniques, the investigator obtains full control of the relevant variables for a particular experiment being investigated (Church, 1964; Seriven, 1967, D’Amato, 1970). Control is achieved by equalization of the effect of the relevant variables over all values of the independent variables of the study (Seligma, 1969). And this may well be equated in a particular experiment particularly if the number of the total sample involved is small (Rescorla, 1967). Counterbalancing
techniques on other hand, can provide, either type of control i.e. equalization of the effects of the relevant variables in the single experiment or over the long run (Rescorla, 1967).

In the present investigation, the controls were exercised using these control techniques:

Matching of the group was one control where in all the relevant variables were controlled. The groups were matched on all the relevant variables like intelligence, age, gender, socio-economic status and entry behaviors of the learners etc. This was essential also because, instructional treatments were administered in different schools to avoid contamination. The control of this experimental variable was also exercised by assigning the same teacher to all the treatment groups. Hence, all tests and instructions were imparted under similar conditions of classroom environment and instructions. Since the experimenter could not administer the treatment exactly in the same period of time, there remained a gap for each school. The limitation was however overcome by employing a 3x3 ANOVA on scores and the initial differences were taken care of by the statistical analysis.

Randomization was another control, which was exercised for the allocation of schools.

3.3 Design of the study

A research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and to control variance (Lindquist, 1956). In the present study, the Descriptive Exploratory Method of research was used and a 3x3 factorial design has been employed for analysis of the data. The method involves events that have already existed and may be related to a present condition. This method was chosen because of these distinctive advantages for the various aspects of parental involvement on cognitive skills of students.

In the present investigation the main dependent variable was performance in mathematical skills. The independent variables were Blooms Taxonomic categories and parental involvement which have been studied at three levels each. The schematic layout of the design has been shown in figure.
Abbreviations Used

For Parental Involvement
- HPI - High Parental Involvement
- API - Average Parental Involvement
- LPI - Low Parental Involvement

For Categories of Blooms Taxonomy
- R - Remembering
- U - Understanding
- Ho - Higher Order
3.4 Procedure of the study

The study was conducted at two stages:

- **Stage I: Selection of the sample:** The procedure adopted for selection of the sample has already been discussed under the heading sample.

- **Stage II: Collection of data:** The aim of the present investigation was to study impact of Parental Involvement. All the tools employed in this study were administered to 275 students and their parents in all the three schools of Chandigarh city.

- **Fixing the schedule**

  After the selection of the sample, Principals and teachers of the selected schools were contacted with prior appointment. A schedule was fixed to collect information from the students’ of three schools with the help of the respective class teachers. On the scheduled date informal introduction with the students’ was done through their class teachers to develop rapport. Proper conditions for data collection were ensured before administering of tools.

  The schedule of data collection has been given in the table no. 3.3.

**Table 3.3. Showing schedule of administration of the tools in various schools under study**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of school</th>
<th>No. of Students</th>
<th>Achievement Text</th>
<th>Parental Involvement Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Class VI</td>
<td>Class VII</td>
</tr>
<tr>
<td>2.</td>
<td>Shivalik Public School Sec-41 D Chandigarh</td>
<td>91</td>
<td>4/14/10 (30)</td>
<td>6/12/10 (30)</td>
</tr>
<tr>
<td>3.</td>
<td>Govt. Model Senior, Sec. School Sec-10, Chandigarh</td>
<td>95</td>
<td>13/12/10 (33)</td>
<td>14/12/10 (32)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>275</td>
<td>96</td>
<td>90</td>
</tr>
</tbody>
</table>
Administering the tools

After establishing a proper rapport with the students, achievement test of mathematics was administered to small groups and in all it has taken nine days with every class, as only one class was given achievement test in one day. The testing conditions for all the students were kept as constant and uniform as far as possible. Before starting the testing session, it was ensured that the subjects were seated comfortably in a room where there was no outside disturbance. The subjects were told to solve all questions. Instructions for each test were given at the top of each questionnaire and the investigator has himself explained the instructions in clear terms and simple language for each test. The subjects were assured that the information revealed by them would be kept confidential, since it was being collected for the purpose of research only. When the collection of data from the students was over, the parents of these students were approached on parent-teacher meet and the scale of parental involvement were given to them. They submitted the forms next day. Few parents neither provided information at the time of meeting nor did they send the filled form through their children. After a little persuasion remaining forms were collected only 15 parents did not provide information even after persuasion so they were dropped from the sample at the initial stage only.

3.5 Statistical techniques used

- Descriptive statistics such as Mean & Standard Deviation were worked out to study the general nature of the sample.

- 3x3 Analysis of variance followed by t-tests was employed to analyse data for significant F-ratios.