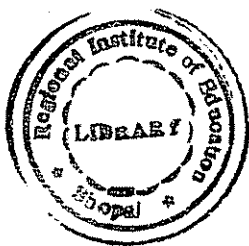


# Chapter - III

# METHODOLOGY



## CHAPTER - 3

# METHODOLOGY

The purpose of educational research can not be completed without the detailed design of investigation. This chapter deals with the methodology employed to achieve the objectives of the study mentioned in chapter one under the following headings.

- Population.
- Sample
- Variables
- Tools
- Administration of Tools.
- Scoring
- Statistical Techniques.

### 3.1 POPULATION :

Population or universe means the entire mass of observations which is the parent group from which a sample is to be formed. In the study the students of class VII studying in Government and Private schools of Bhopal district form the population. There are about 50 districts in M.P. and total blocks are 313. In Bhopal there are nearly about 260 School. Out of which some are government and some are private. For the study the researcher has taken 4 government schools and 3 private schools.

### **3.2 SAMPLE :**

Data collection is an important part of the research. Data is collected from a selected sample and the sample is the representation of population. According to Borg and Gall (1983). "The larger group we wish to learn is called population whereas the smaller group we actually study is called sample". Thus sample is a portion of the population which represents the population".

A good sample must be as nearly the representative of the entire population as possible and ideally it must provide the whole of the information about the population as from which the sample has been drawn.

In government and private school there are at least 4 section of VII standard and each section has the strength of around 40 to 45 students. Finally the section taken was not selected by the researcher but it was per suitability of school authority. The number of students present in one section was finally taken. The sample size of this study is 300 students of VII standard. The sampling technique used here is simple random sampling.

### **3.3 VARIABLES :**

The major variables of the study are problem solving ability and mathematics achievement. Besides these major variables, the researcher has taken into consideration certain demographic variables. They are gender, type of school, father education, father occupation, mother education and mother occupation.

### 3.4 TOOLS :

Following tools were developed and administered by the investigator to collect data for present study.

#### **PROBLEM SOLVING :**

Problem solving ability is one kind of the test of student's intelligence. In day to day's life a person faces many problems and tries to solve them. It can be done only by right thinking and proper reasoning which depends on the level of intelligence of the person. A person with average intelligence should be able to solve simple day to day problems, with below average intelligence with not able to solve even simple problems, but a person with a high level of intelligence would be able to solve complex or difficult problems as compared to the other two categories. Problem solving is a continuous process of multidirectional efforts. To test the problem solving ability of a person various problem solving ability test has been made. The researcher has used one of the standardized problem solving test.

The test is of 45 minutes duration. It has been prescribed to assess the level of intelligence of the students. A student has to answer a series of questions which have set in ascending order starting from the simple to complex one to avoid monotony and fatigue of the subject. Items have been selected after careful examination of available test of Problem solving inventories. Reasoning test, Intelligence test etc. including mathematical puzzles, problems concerned with general knowledge and series tests. This test is a test paper cum answer sheet i.e. no separate

answer sheet was given to the students. Students were supposed to write answer in the appropriate place provide for each items.

Garg RR (2004) developed this test that consists of 22 items.

**Reliability :**

D- 345

With the help of the following methods the reliability coefficient has been calculated.

1) Split - Half method (Spearman - Brown formula)  $r = .863$

2) Rational Equivalence Method (Kudar-Richardson Formula)

$r = .791$  (N=280 students)

**Validity :**

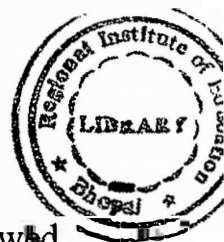
The validity coefficient of the present test has been calculated by the correlating the scores of intelligence test and present test (N=135). The following correlation have been found.

1) Group test of Intelligence (Dr. Prayag Mehra) .723

2) Group test of Intelligence (Dr. R.K. Tandon) .681

**ACHIEVEMENT TEST**

In education the term Achievement Test has been borrowed from medicine where it is used to find out the root cause of the symptom fever, pain etc. The achievement is followed by the



appropriate treatment. The evaluation in the form of achievement testing could be both formative or summative evaluation. Achievement test is used to measure the achievement of the learner after a duration of the teaching learning process. The purpose of achievement test is to evaluate and accumulate data regarding the findings of the root cause. In the present study the researcher has prepared a achievement test taking all the topic or in other words from the test book of mathematics of VII standard. Achievement test was made by the researcher according to the blue print.

The topics include in the test were from the chapters.

- 1) Number system.
- 2) Algebra.
- 3) Trigonometry / Menstruation
- 4) Geometry.

The test consisted in 3 form of questions like very short answer, short answer type and long answer type. Like problem solving test it also a test paper cum answer sheet that is no separate answer sheets was given to the students. Students were supposed to write answers in the appropriate place provided for each item. There are 22 items in achievement test. The total marks for the achievement test is 50. Question no. 1 to 6 is given 1 mark. Question no. 7 to 14 is given 2 marks. Question no. 15 to 18 is given 3 marks and Question no. 19 to 22 is given 4 marks.

### 3.5 ADMINISTRATION OF THE TOOLS :

The researcher personally met with principal of the school and acquainted with the teachers concerned and established rapport with the students. Prior to administration the tests students were explained about both the test that they were supposed to attempt.

The significance of the tests and necessary instructions were given to them. The students were made clear that this test is designed to help them and is not for grade. After this the researcher administered with tests on the students. The study was conducted on both male and female students. They were given questions paper and asked to answer the questions which they thought correct. Adequate time was given to the students to complete the test. The students were observed during the test. were observed during the test. Situation and the rapport achieved between the tester and test throughout the examination are of importance in respect to both quantitative and qualitative results obtained. The investigator had friendly contact with tester and was strict to the instruction given below :-

- 1) Here are some questions given read the problem carefully and understand it before giving the response.
- 2) Each problem is followed by a number of possible responses among which only one response is correct. Write the serial number of only that response which you think is correct in the given space.

- 3) You have to complete this test within 45 minutes time. If you do so before time then check your answer.

### **3.6 SCORING :**

The problem solving test consist of 22 problems along with alternative answer (except item No.2 and 20) in which only one answer is correct. If the testee writes the correct answer he should be awarded one marks and for the wrong answer zero should be given. The maximum marks will be 22. Similar in the achievement test different mark is allotted to different question. For every correct answer marks allotted and for every wrong answer marks is deducted. Total number of questions in the achievement test is 22 and total marks are 50.

### **3.7 STATISTICAL TECHNIQUE USED :**

In order to find the influence of parents' education and occupation on problem solving ability and achievement in Mathematics, ANOVA was carried out. In order to find the significance of difference of means between boys and girls; and between students of government and private schools in respect of their problem solving ability and achievement in Mathematics, 't' test was used.