

RESEARCH METHODOLOGY

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction:

Research methodology involves the systematic procedure by which the researcher starts from the initial identification of the problem to its solution.

Research design includes the following points:

- Objectives of the study.
- Hypotheses to be tested.
- Variables used in the study.
- Sampling process.
- Tools used and methodology.
- Statistics used.

Among these, objectives and hypotheses are discussed in chapter – I.

3.2 Sample:

A well designed research procedure and use of appropriate techniques defines the methodology of research. The research work cannot be undertaken without the use of sampling. The study of total population is not possible.

In the words of Kerlinger,

“Sample is a part taken from the population wholly and truly.”

Sampling for this study was purposive. In all there are 55 students of grade VIII, from two different schools of Yavatmal district taken for study.

The schools are:

- 1) Zila parishad High School, Yavatmal.
- 2) Abhyankar Kanya Shala, Yavatmal.

- 55 Students from both the above schools of grade VIII are taken for study.
- The selected sample has changed their medium of instruction in grade VIII and completed their grade VII from the same school through Marathi medium.
- The sample was controlled regarding average achievement.

STUDENTS TAKEN FOR THE STUDY

S.N.	Name of the school	Number of students		Total
		Boys	Girls	
1	Zila Parishad High School, Ytl.	15	04	19
2	Abhayankar Kanya Shala, Ytl.	--	36	36
Grand Total		15	40	55

Table 1

3.3 Variables:

Variables are attributes or quality which exhibits the difference in magnitude and which varies along certain dimensions.

Independent Variable:

It is that factor which measured, manipulated or selected by which the researcher determines its relationship to an observed phenomenon.

Dependent Variable:

The dependent variable is that factor which is observed and measured to determine the effect of the independent variable i.e. the factor that appears,

disappears or varies as researcher introduces, removes or varies the independent variable.

Controlling Variable:

Those variables whose effects must be neutralized or controlled are called controlled variable. They are defined as those factors which are controlled by the researcher to cancel out or neutralize any effect they might otherwise have on the observed phenomenon.

List of Variables:

Independent Variables – Test I, Test II.

Dependent Variable – Achievement.

Test I – Achievement test in Mathematics using English Language.

Test II – Achievement test in Mathematics using Marathi Language.

3.4 Research Tools:

In order to identify the achievement in Mathematics after changing the medium of instruction in grade VIII, empirical analysis of achievement is necessary. This includes the achievement in Mathematics after changing the medium of instruction of both male and female children at elementary levels. This analysis has been carried out, by employing the following tools:

- 1) Test in English for students Test I.
- 2) Test in Marathi for students Test II.
- 3) Achievement in Mathematics
- 4) Interview of students and teachers

The tools used in this study are two self-constructed tests i.e. Test I and Test II.

Test I:

The Test I prepared for the students in English language keeping in view the competencies and understanding of the language used in Mathematics.

Test I comprises 14 questions of 50 marks. The students will solve these on separate papers.

Test II:

The Test II will also contain same questions as in first Test I but the language will be Marathi. This Test II possesses 14 questions of 50 marks.

The students will also solve these on separate papers.

Achievement in Mathematics:

To assess achievement in Mathematics, the marks of Mathematics of their annual examination of grade VII and half yearly examination of grade VIII are collected from the school record.

Interview of students and teachers:

The researcher conducts these separately. For the student’s researcher asked about different difficulties they faced after changing the medium of instruction. For teachers, the researcher asked about the method of teaching, difficult topic etc.

3.5 Administration of Research Tools:

A sample of 55 students (boys’ and girls’) from the grade VIII in the age group of 13-14 years is taken from the three schools on the basis of their access and criteria for selection.

In the beginning Abhayankar Kanya Shala, Yavatmal, was visited by the researcher. Before administering the test students have been told that it will not have any effect on their school achievement. Clear instructions were given beforehand. Next day, Test I was distributed to students. Subjects were asked to write their names, class, sex and school name on the top of

the sheet. Two hour time limit was given to the students. Separate papers were provided to solve the questions.

On the next day Test II was given. The same procedure and instructions had given for Test II. After completion of time researcher collected the sheets from the students.

The same process was executed in the next school, Zila Parishad High School, Yavatmal.

Since the sample was taken from different schools therefore the above mentioned processes were used in all the schools.

In this way the investigator collected desired data from schools by applying the processes which are elaborately explained in sub chapter – Administration of research tools.

Statistics used:

Two independent variables primarily formed the foundation of this study.

These variables include:

- i) Test I
- ii) Test II

Data is also collected from the school record and analyzed with the help of following variables,

- i) Final result of grade VII in Mathematics.
- ii) First term examination result of grade VIII in Mathematics.

The result are presented under these major categories, their relationship to gender level is also shown.

The score obtained according to two schools, and then according to gender of the students.

The mean score and standard deviation for each group is computed using the formula given below:

$$i) \quad M = A.M. + \left[\frac{\sum fx'}{N} \right] \times i$$

Where,

Σ = Summation

A.M. = Assumed mean

f = Respective frequency of the class-interval

i = Class interval

N = Total frequency

x' = Deviation from the assumed mean.

ii) The standard deviation is computed using the formula given below:

$$\sigma = i \times \sqrt{\left[\frac{\sum fx'^2}{N} \right] - \left[\frac{\sum fx'}{N} \right]^2}$$

Where,

σ = Standard Deviation

f = Respective frequency of the class-interval

i = Class interval

N = Total frequency

x' = Deviation from the assumed mean.

't' test is applied for the difference in mean and standard deviation of two categories of variable. The formula for 't' test is used as follows:

$$t = \frac{M1 - M2}{\sigma_D}$$

Where,

$M1 - M2$ = Difference between means of two categories.

$$\sigma_D = \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}$$

where

σ_D = Standard error of difference between means.

σ_1 = Standard deviation of first group.

σ_2 = Standard deviation of second group.

N_1 = Total number of frequency of group one.

N_2 = Total number of frequency of group two.

* * * * *