CHAPTER_3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research design, research tools, techniques, sampling methods, data collection, and statistical techniques used in the study. The methodology has been carefully chosen to study the relationship between students' interest in mathematics and the school environment among Class 9 students of selected secondary schools of Bhopal (MP).

Research methodology is a process or technique that is used to identify, select, process, analyze, and interpret data and information about a topic.

The overall framework of the research is referred to as the methodology, which outlines everything the researcher must obey, from selecting the problem to applying findings to the selected group. The research design offers a systematic structure for proper testing and understanding the relationships between variables. It indicates what observations should be made and how to analyze quantitatively the collected data. Methodology that guides the direction of observations and analysis, specifying statistical tests to employ and suggesting proper conclusions on the bases of the analysis. Based on a review of existing literature, the research gaps, and a right understanding of prior research, the current study was planned and its methodology were selected in line with its objectives. The first chapter outlined the introduction, problem and concepts, while the second chapter reviewed related literature. This chapter details the complete methodology used to conduct the study and achieve its objectives.

To fulfill the objectives and test the corresponding hypotheses, this study has been employed to a specific plan. The descriptive method of research, widely utilized in educational research, has been adhered to gather relevant information through questionnaires. While descriptive research primarily involves measurement, classification,

analysis, comparison, and interpretation, the methodology used for this study is outlined in the subsequent sections of this chapter.

3.2 RESEARCH DESIGN:

A descriptive survey method was used as the research design of present study has been drawn by the researcher. The present study of student's interest in mathematics in relation to school environment among secondary schools of Bhopal. The students of class IX were selected randomly. Selection of population, sample, tools and appropriate or required statistical technique integrating both quantitative data (inventory scores) and qualitative feedback (open-ended responses) were followed by collecting data, scoring, analysing for further process, applying statistical techniques and utilizing to write a dissertation report.

3.3RESEARCH METHOD

Descriptive survey method applying for the present study student's interest in mathematics in relation to school environment among secondary schools of Bhopal, students studying in class IXth.

3.4 VARIABLES OF THE STUDY

The variables are the characteristics and nature that manipulate, observe, study and control. The variables of the current study are:

1. **STUDENTS' INTEREST IN MATHEMATICS**
2. **SCHOOL ENVIRONMENT**

Elements of each variable are:

- Gender
- Different boards

- Types of schools

3. **Students' perception**

3.5 POPULATION

Population is a set of people having the same characteristics. In this research, researcher select the population of secondary school students of class XII from the four schools of Bhopal district (MP).

3.6 SAMPLING FRAME

The sampling frame is the list from which units are drawn for the sample. Sampling helps to reduce expenditure and to save time and energy. It permits measurement of greater scope, greater precision, and accuracy. It also provides generalizations on the basis of a relatively small proportion of the population

3.7 SAMPLE

A sample is a small part of a population which is selected for analysis and observation. It is a subset or consisting of a part of the collection of the objects or individuals of the population selected for the purpose of representing the population. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it is drawn. A good sample must be a good representative of the entire population as

possible and ideally, it must provide the whole of the information about the population from which it has been drawn.

The sample of present study was selected by using stratified random sampling. The present study consists of total 120 students (60boys and 60 girls) of secondary schools of class XII, 30 students (15 boys/15 girls) from each school were selected randomly, four schools are selected (two private in which one is affiliated to CBSE and other from STATE board and two Government in which one are affiliated to CBSE and one from STATE boards schools of Bhopal district (MP).

The sample comprised “120 students of Class 9” from four schools:

DMS (RIE): CBSE, Government

Bal Bhawan School: CBSE, Private

St. Michael School: State Board (NCERT based), Private

Jahangiria School: State Board (NCERT based), Government

Each school contributed 30 students (15 boys and 15 girls), selected randomly.

Table:3.7 SAMPLE OF THE STUDY

Class	**No of students**	
IX	Boys	60
	Girls	60
	Total	120

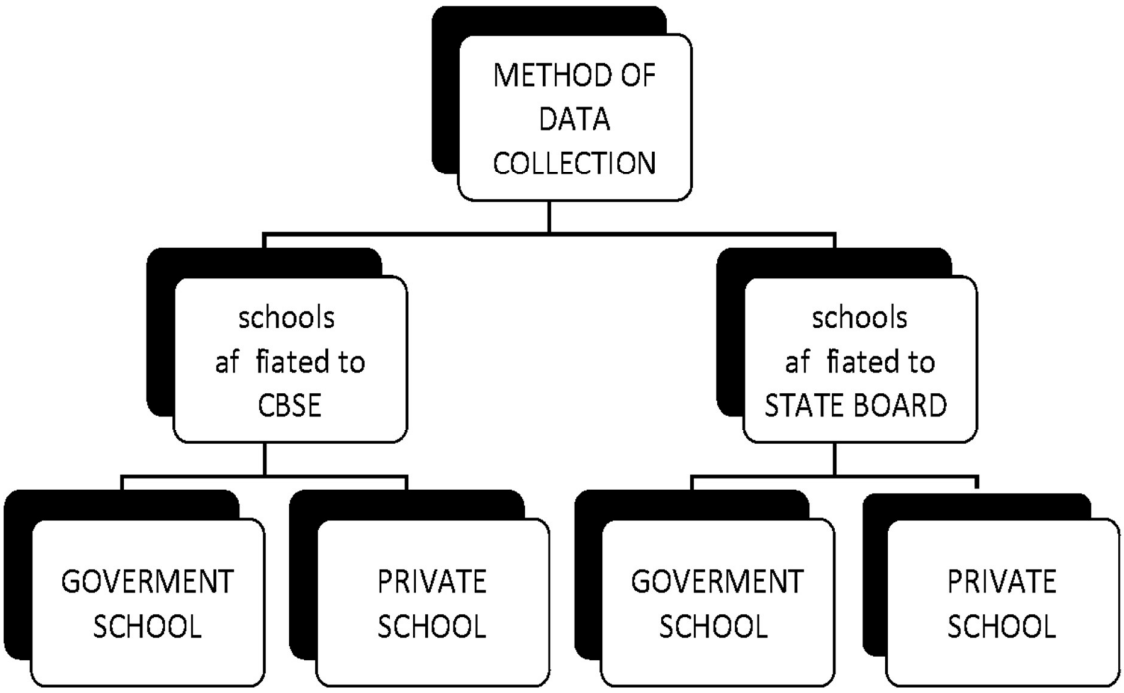

Figure: 3.7

3.8 TOOLS

Tools administered or selected to collect data refers to the instruments used to collect data, such as inventories, scales, questionnaires, interview, google forms, etc… These are used to measure the variable, or to collect information which is necessary for study. Various types of tools are used in educational studies. By selecting an appropriate tool enables the researcher to achieve the objectives in an effective manner; otherwise, it affects the entire findings of the study. Generally, the tools are selected based on the objectives of the study, and the size and characteristics of the sample. Information gathering for a variety of topics and subtopics from a large number of population available at one place is possible only with the help of appropriate tools.

3.8.0 Tools Used

1. Mathematical Interest Inventory by L.N. Dubey to study the mathematical interest of students.

2. School Climate Scale by Dr. Anita Soni & Dr. Ashok Sharma to measure the

3. Three Open-ended Questions to assess students' perceptions prepared by Researcher. To know the perception of students of class 9^{th}.

3.8.1 RELIABILITY AND VALIDITY

Mathematical interest inventory and school climate scale was validated against the general perceived mathematical interest and school climate scale were developed originally by L N DUBEY and school climate scale by Dr. Anita Soni and Dr. Ashok Sharma.

3.9 DESCRIPTION OF TOOLS

Mathematical interest inventory developed by **L N Dubey** M. A (psy) M. Ed educational psychology and guidance college, JABALPUR which were published by AGRA PSYCHOLOGICAL RESEARCH CELL was used to find out students' interest level of mathematics. This inventory is applicable to use on individuals of 13-15 years of age.

Table:3.9. a. Items indicating liking and disliking for mathematics.

Indications	Item no.
Liking	1, 2, 4, 6, 9, 11, 15, 16, 21, 23, 24, 26, 28, 29, 31, 33, 34, 36, 38.
disliking	3, 5, 7, 8, 10, 12, 13, 14, 17, 18, 19, 20, 22, 27, 30, 32, 35, 37, 39, 40

Table:3.9.b. Categorization of Interest Scores Interest levels were classified as:

SCORES	**LEVEL OF INTEREST**
33-above	High Interest
27-32	Above Average Interest
21-26	Average Interest
15-20	Below Average Interest
0-14	Low Interest

2. **School climate scale** developed by Dr. Ashok Sharma and Anita Soni was published by AROHI MANOVIGYAN KENDRA, JABALPUR is used to analyze the environment of school, that is the perception of students towards school. The scoring of scale in a manner:

Table:3.9.c school climate marks distribution

Yes	uncertain	no
scoring 3 marks for positive questions responses and score 1 for negative question responses	Scoring two marks for each response	Sore 1marks for response positive question and 3 marks for negative question response

3. And three open-ended questions prepared by researcher which are used to ask students' perceptions. Questions are;

i. What is your perception of mathematics?
ii. Any reason why you are interested/not interested in mathematics?
iii. Anything else you may share with us about mathematics and math classes?

3.10 STATISTICS USED

The statistical methods are:

1. Mean
2. Standard deviation
3. Relationship
4. t- ratio

   correlated sample

   independent sample

5.significance