CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

The significance, background of the study, objectives along with the hypotheses of the study represents under different headings of chapter-I. The literature reviews are presented in chapter-2. The methodology, variables, sample, design, tools and techniques, procedure of data collection and the statistical techniques used for the analysis of data are presented in chapter-3. In this chapter, objective-wise analysis of the data is presented, below, under separate headings.

Analysis of data is the heart of the research report (Best 2007). It is an essential, important and comprehensive process intended to study the underlying relationship among various objectives or hypotheses. Each of the objectives is addressed by analyzing data and then determining whether the hypotheses for that objective are supported or not. As described in Chapter 3, the majority of this study was based on quantitative data collected by using an objective test. Interpretation of data is an extremely important and useful branch of science of statistics. Statistical facts by themselves have no utility, but interpretation makes it possible to utilize the collected data in various fields of activity. The usefulness of collected data lies in its proper interpretation. In the present study, the following prerequisites are kept in mind for the scientific interpretation of data collected through relevant tools.

4.2 Statistics used in the study

(a) Mean

Mean denotes the average of given data

(b) standard deviation

By calculating SD we have to measure variability of data

(c) level of significance:

It is a measure of the strength of the evidence that samples before you will reject the null hypothesis and conclude that the effect is statistically significant. The researcher determines the significance level before conducting the experiment

In this research the level of significance was 0.05.

(d). t test:

To determine the significance of difference between two means

4.3 TECHNIQUES USED IN DATA ANALYSIS:

In the present study the scores of students of secondary schools of Bhopal on mathematical interest inventory and school climate scale in the terms of score, Mean, Standard deviation, Correlation, t-ratio, significance have been applied.

4.4 Interest in Mathematics Inventory Results

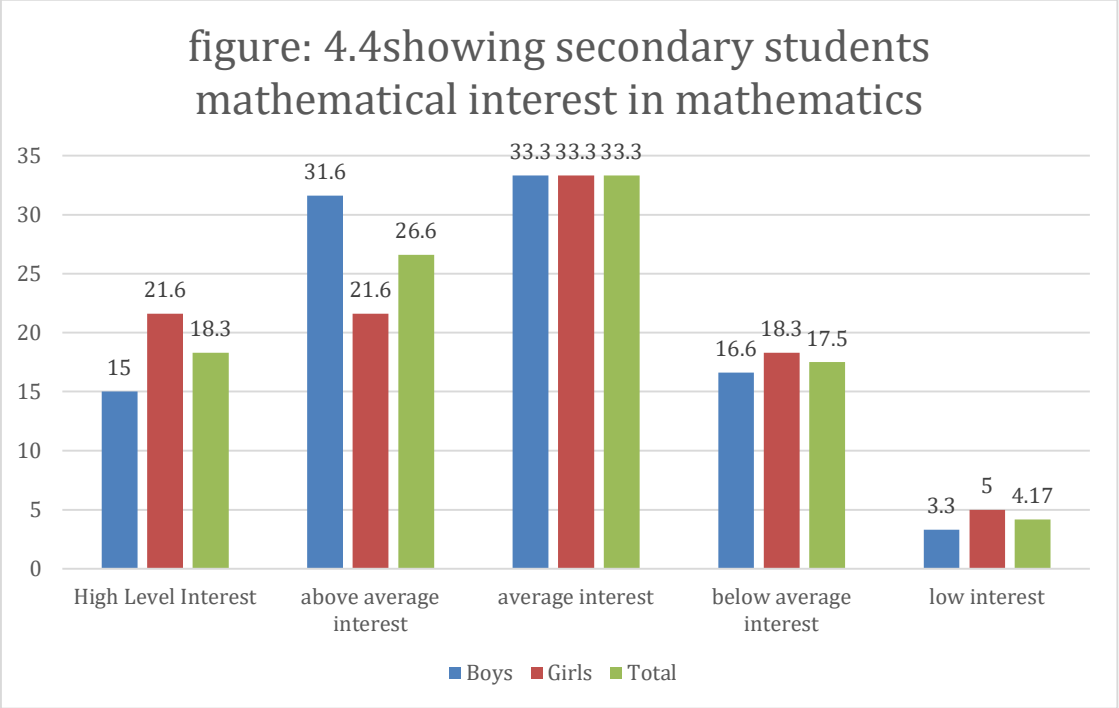
Objective 1: To study the mathematical interests of secondary school students.

Hypothesis: There is no significant difference in mathematical interest of secondary school students.

The mathematical interest inventory categorized students into five levels based on their scores. The table below shows the distribution of students across these categories.

Table: 4.4. showing secondary students' mathematical interest in mathematics

Interest Category	High Interest	Above Average Interest	Average Interest	Below Average Interest	Low Interest
Boys	09	19	20	10	02
Percentage (boys)	15	31.67	33.33	16.67	3.33
Girls	13	13	20	11	03
Percentage (girls)	21.67	21.67	33.33	18.33	5
Total responses	22	32	40	21	05
Percentage	18.33%	26.67%	33.33%	17.50%	4.17%



From the above data, it is observed that the majority of students (60%) exhibit average to above average interest in mathematics. Only a small portion (4.17%) of students showed low interest.

4.5. COMPARISON OF students' interest in mathematics

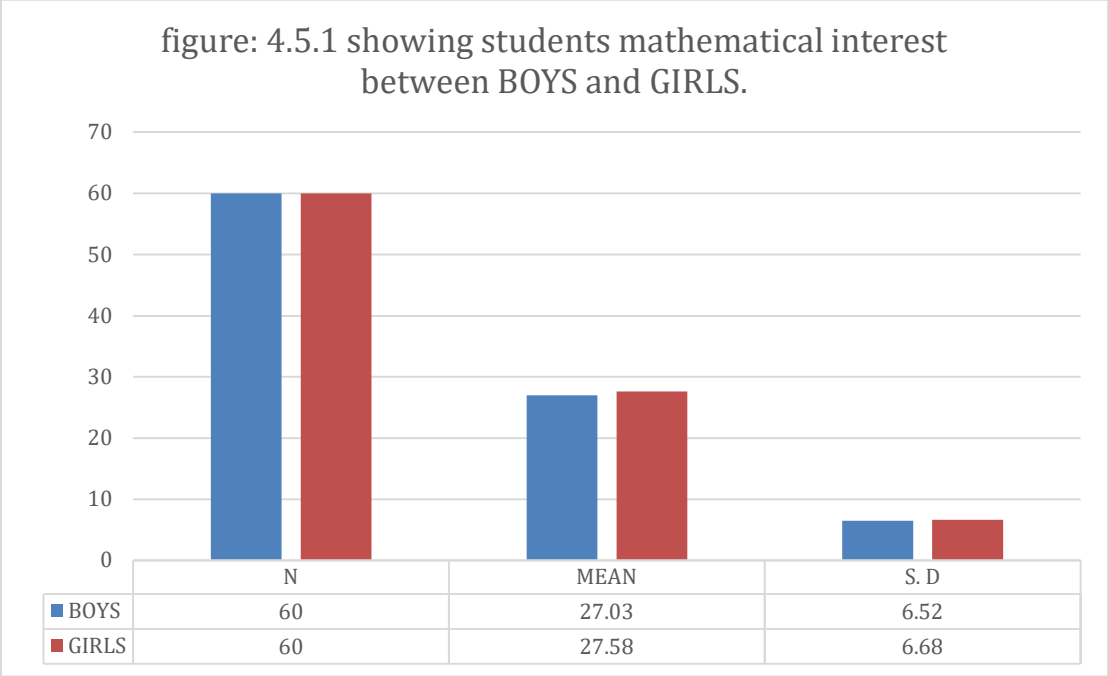
4.5.1 mathematical interest between boys and girls of secondary school

Objective 2: Compare Mathematical Interest Between Boys and Girls

Null Hypothesis 2: There is no significant difference in mathematical interest between boys and girls.

Gender	N	Mean	S. D	t-ratio	p-value
BOYS	60	27.03	6.52	-0.48	0.632
GIRLS	60	27.58	6.68		

Table:4.5.1 showing mean and S. D of students' mathematical interest between BOYS and GIRLS.



There is no statistically significant difference in the mathematical interest scores between boys and girls of secondary schools. This supports the null hypothesis that gender does not significantly affect interest in mathematics.

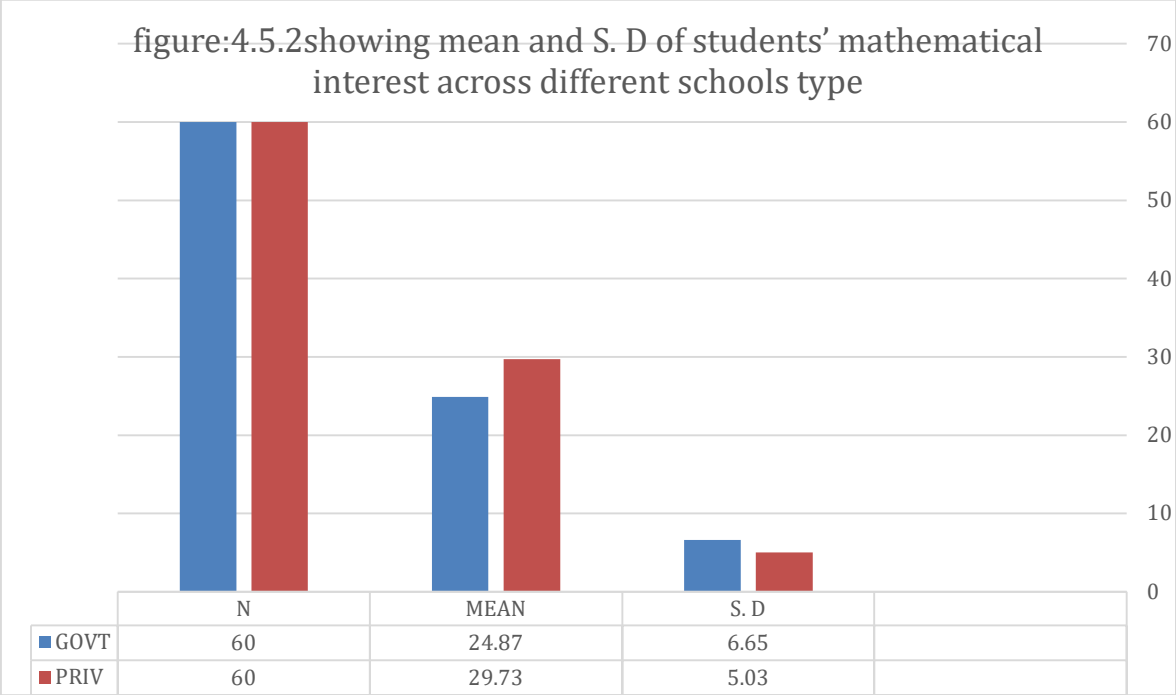
4.5.2 mathematical interest of students of government and private schools

Objective 3: Compare Mathematical Interest Between Govt and Private Schools

Null Hypothesis 3: There is no significant difference in mathematical interest between students of government and private schools.

Gender	N	Mean	S. D	t-ratio	p-value
GOVERNMENT	60	24.87	6.65	-4.52	<0.001
PRIVATE	60	29.73	5.03		

Table:4.5.2 showing mean and S. D of students' mathematical interest between GOVERNMENT and PRIVATE.



There is a statistically significant difference in mathematical interest between students of government and private schools. Private school students exhibit higher interest in mathematics. Hence, the null hypothesis is rejected.

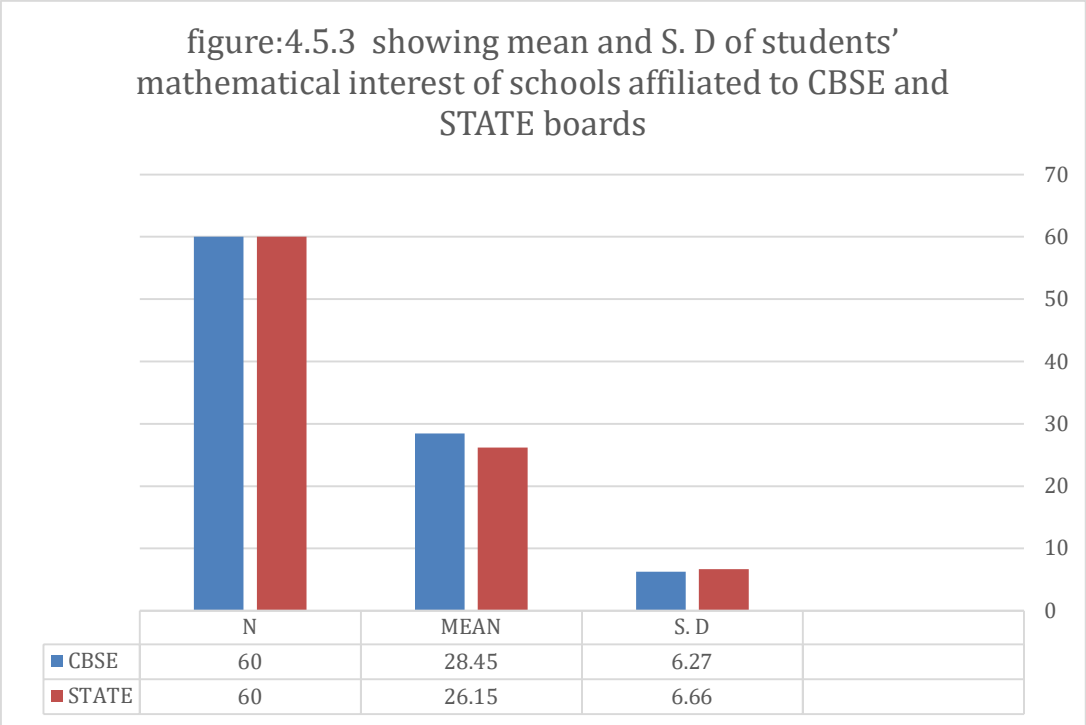
4.5.3 mathematical interest of students of schools affiliated to CBSE and STATE board

Objective 4: Compare Mathematical Interest Between CBSE and State Board Students

Null Hypothesis 4: There is no significant difference in mathematical interest between students of CBSE and State Board schools.

Gender	N	Mean	S. D	t-ratio	p-value
CBSE	60	28.54	6.27	3.24	0.002
STATE	60	26.15	6.66		

Table:4.5.3 showing mean and S. D of students' mathematical interest of schools affiliated to CBSE and STATE boards



There is no statistically significant difference in mathematical interest between CBSE and State Board students. Thus, the null hypothesis is accepted, indicating board affiliation does not impact students' interest in mathematics.

4.6 COMPARISON OF SCHOOL CLIMATE SCALE

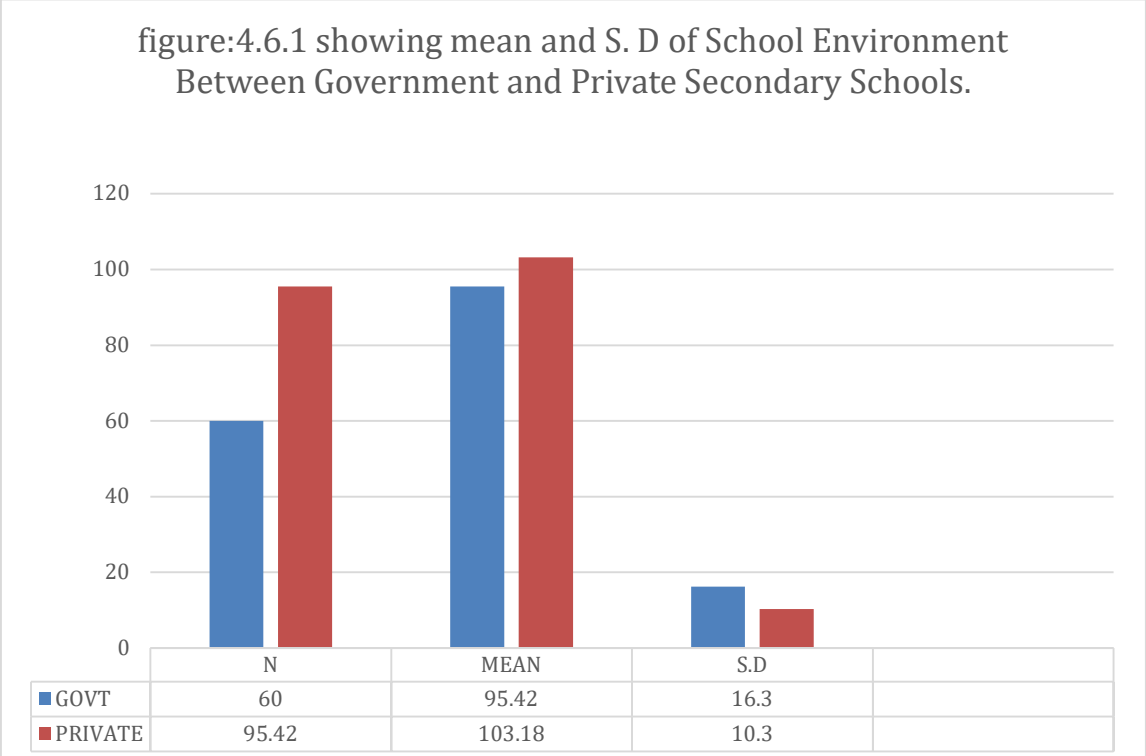
4.6.1 SCHOOL ENVIRONMENT OF PRIVATE AND GOVERNMENT SCHOOLS

Objective 5: Compare School Environment Between Government and Private Secondary Schools

Null Hypothesis 5: There is no significant difference in the school environment of government and private secondary schools.

School Type	N	Mean	S. D	t-ratio	p-value
Government	60	94.42	16.3	-3.89	<0.001
Private	60	103.18	10.3		

Table: 4.6.1showing mean and S. D of School Environment Between Government and Private Secondary Schools.



The p-value (0.0022) is below 0.001, so we reject the null hypothesis. Private schools demonstrate a significantly better perceived school environment than government schools.

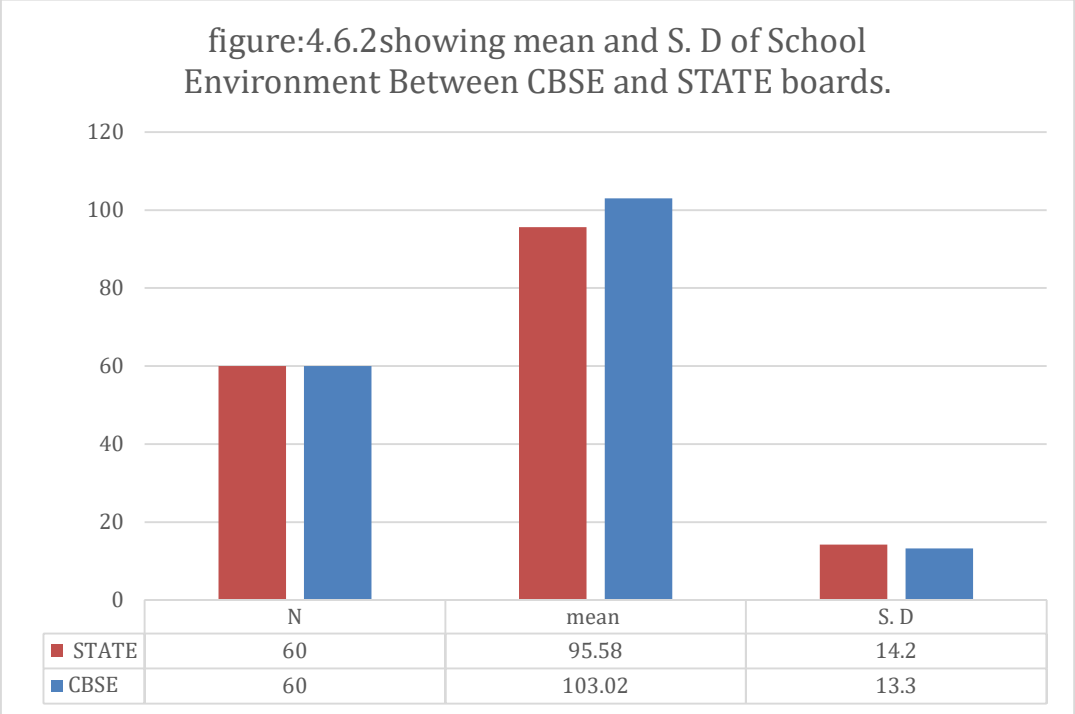
4.6.2 SCHOOL ENVIRONMENT OF SCHOOLS AFFILIATED TO STATE BOARD AND CBSE

Objective 6: To compare the school environment of CBSE and STATE board affiliated schools.

Hypothesis 6: There is no significant difference in interest in mathematics between students of schools affiliated to different boards.

Board	N	Mean	S. D	t-ratio	p-value
CBSE	60	103.02	13.3	**3.79**	**<0.001**
State	60	95.58	14.2		

Table:4.6.2 showing mean and S. D of School Environment Between CBSE and STATE boards.



There is no statistically significant difference in school climate scores between CBSE and State Board schools. Thus, we accept the null hypothesis, indicating board affiliation does not significantly affect the school environment.

4.7 Correlation Between Mathematical Interest and School Climate

Objective 7: To study the relationship between mathematical interest and school environment.

Hypothesis: There is no significant relationship between the school environment and students' interest in mathematics.

S. NO	VARIABLES	N	D F	Correlation (r)	Level of significance
1.	Mathematical interest	120	118	0.46	Significant relationship
2.	School environment	120			

Table:4.7 showing correlation between mathematical interest and school environment.

Correlation Between Mathematical Interest and School Climate Using matched samples of inventory scores and school climate scores

Pearson Correlation Coefficient (r): 0.46

Interpretation: There is a moderate positive relationship between interest in mathematics and the perceived quality of the school environment. This supports the hypothesis that a better school environment encourages more interest in mathematics.

This coefficient (r = 0.46) is higher than the critical values at the 0.05 and 0.01 significance levels, indicating a moderate positive and statistically significant relationship.

The result supports our hypothesis and aligns with Naresh Gandhi's (2017) conclusion that the school environment significantly influences interest levels.

The gender analysis, although limited in sample here, reflects the pattern observed in Kanchan Bala's (2023) work: while boys may show higher means, the differences may not always reach statistical significance when tested across larger populations.

4.8 Analysis of Perception of Students' Interest in Mathematics

CBSE Schools vs. State Board Schools

CBSE private school students (Bal Bhawan) show higher interest in mathematics.

State board schools (especially Jahangiria) have more students in the average category.

Private Schools vs. Government Schools

Private schools (Bal Bhawan, St. Michael) have a higher proportion of students in the high-interest category.

Government schools (DMS, Jahangiria) have more students in lower and average interest levels.

Gender Comparison

Girls in Jahangiria are mostly in the average category, possibly indicating a neutral attitude towards math.

Girls in St. Michael and Bal Bhawan have a higher percentage in the high-interest category, showing greater enthusiasm.

Boys in CBSE schools (DMS, Bal Bhawan) have a more balanced distribution, with a mix across all interest levels.

Conclusion: Students' attitudes toward mathematics are shaped by personal confidence and school experiences. A motivating teacher and interactive classroom significantly improve perceptions.