CHAPTER-IV
DATA ANALYSIS
&
INTERPRETATION

CHAPTER-IV

ANALYSIS OF DATA AND INTERPRETATION OF RESULT

4.0.0 INTRODUCTION

Chapter-I deals with the introduction, rationale of the study, objectives, hypotheses and the delimitations of the research. Chapter-II deals with the review of the related literature. The methodology, sample, design, tools, procedure of data collection and the statistical techniques used for the analysis of the data are presented in Chapter – III. Objective-wise results, interpretations and the findings are presented under the different captions, in the present chapter.

4.1.0 COMPARISON OF ACHIEVEMENT IN MATHEMATICS OF TRIBAL AND NON- TRIBAL STUDENTS IN CLASS IX

The first objective of the present research was to evaluate the mathematical and all subject proficiency of tribal and non-tribal students in class IX. Therefore, the result related to the Achievement level of mathematics and all subject results related to each of these are presented under separate captions below as 4.1.1 and 4.1.2.

The data related to Achievement in Mathematics of tribal and non-tribal students was collected from the school register. These marks were secured by the students in the school examination. The investigator did not conduct any test for this purpose. The data were analysed with the help of statistical techniques, such as, Mean, SD, Percentiles and t-test.

Table – 4.1: Mean, SD, Percentile of Mathematics Mark of Tribal and Non-Tribal Students

NO. OF STUDENTS	CATEGORY	MEAN	S.D.	PERCENTILE			
				25	50	75	90
46	TRIBAL	51.65	12.63	45.25	51	61.5	69.5
54	NON-TRIBAL	60.29	17.12	46.25	56	74.75	84.7
100	TOTAL	56.32	15.75	46	52	65	80

From Table 4.1, it is evident that the mean scores of Achievements in Mathematics of Tribal group is 51.65 and the mean score of achievement in mathematics of non-tribal group is 60.29. Average score of total Students Achievement in Mathematics on Achievement Test in Mathematics is 56.32 that is

approximately II division. Standard Deviation of Achievement in Mathematics of Tribal group is 12.637 and Standard Deviation of Achievement in Mathematics of non-Tribal group is 17.125 Further, more than 50% students secured above 51% and 561% marks in tribal group and non-tribal group. 25% students scored more than 61.5% and 74.5% marks in mathematics tribal group and non-tribal group. 10% of students scored more than 69.5% and 74.75% marks in mathematics tribal group and non-tribal group respectively. This kind of achievement in mathematics, generally, Tribal students, on average, score in the II division, whereas non-tribal students secure I division levels, indicating the need for targeted academic support for tribal learners.

Chart-4.1 : Achievement of Mathematics
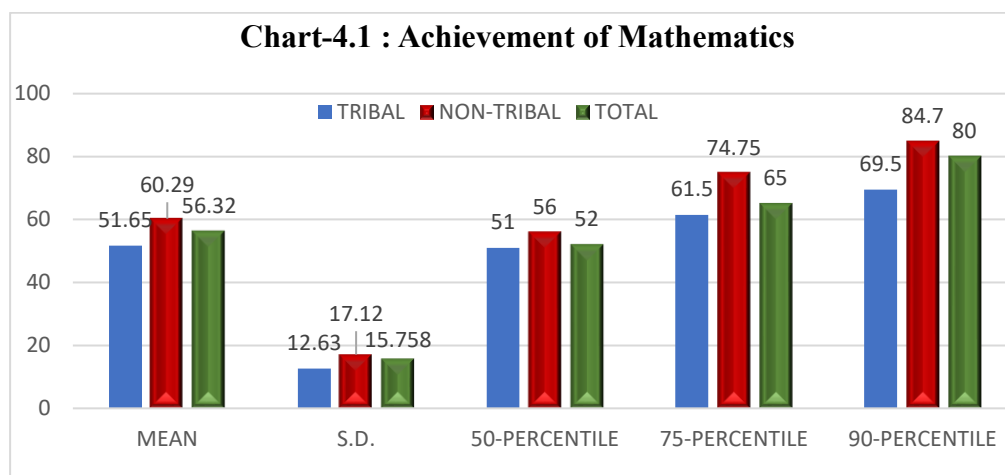
In order to test the significant difference in Achievement in Mathematics of Tribal and the Non-tribal students, the researcher employed t-test for the analysis of data.

Table – 4.2: Mean, SD, SEM and t- value for Achievement in Mathematics of Tribal and Non-Tribal Students

Group	N	df	Mean	Std. Deviation	Std. Error Mean	t - value
Tribal	46	98	51.65	12.637	1.863	2.829**
Non-Tribal	54		60.30	17.125	2.330	

*** Significant at 0.01 level*

Table-4.2 reveals that t-value is 2.829. This value is significant at 0.01 level with df equal to1/98. Therefore, the directional hypothesis, namely, "there is a significant difference in Achievement in Mathematics of Tribal and Non-tribal students of class IX", is not rejected. It implies that the mean score of achievement Mathematics of Tribal students is lower than the Non-tribal students. The SD of Non-tribal students is higher than the Tribal students, therefore the standard error of mean of Non-tribal student is also higher. Therefore, it can be inferred that there is a significant difference in Achievement in Mathematics of Tribal and Non-tribal students.

Finding: There is a significant difference in Achievement in Mathematics of Tribal and Non-tribal students.

4.2.0 COMPARISON OF ACHIEVEMENT ALL SUBJECTS OF TRIBAL AND NON- TRIBAL STUDENTS IN CLASS IX

All-subject proficiency of tribal and non-tribal students was evaluated by collecting the school examination marks from the school register. The investigator did not conduct any test for this purpose. The data were analysed with the help of statistical techniques, such as, Mean, SD and Percentiles. To evaluate how well tribal and non-tribal students perform in overall subjects, the researcher collected marks from their school exams. These exam results were used to compare the achievement levels of both groups.

Table-4.3: Mean, SD and Percentile of All Subject Mark of Tribal and Non-Tribal Students

NO. OF STUDENTS	CATEGORY	MEAN	S.D.	PERCENTILE			
				25	50	75	90
46	TRIBAL	51.78	11.82	42	52	55.75	65.5
54	NON-TRIBAL	59.57	15.17	51.25	55	71.5	81.1
100	TOTAL	56.32	15.75	46	52	65	80

From Table 4.3, It is evident that the mean score of Achievement in Mathematics for the Tribal group is 51.78, while that of the Non-Tribal group is 59.57. The average score of total student achievement in Mathematics stands at 56.32, which corresponds approximately to a II division level of performance. The Standard Deviation (S.D.) for the Tribal group is 11.82, which is lower than that of the Non-Tribal group (15.17), indicating that the Tribal students' scores are more tightly clustered around the mean. This suggests lesser variability but overall lower achievement. Further analysis shows that more than 50% of the students scored above 52 marks in the Tribal group and above 55 marks in the Non-Tribal group. About 25% of students scored more than 55.75% and 71.5% in the Tribal and Non-Tribal groups respectively, while the top 10% of students scored above 65.5% and 81.1% in Mathematics in the respective groups.

Chart-4.2: Achievement of all subject
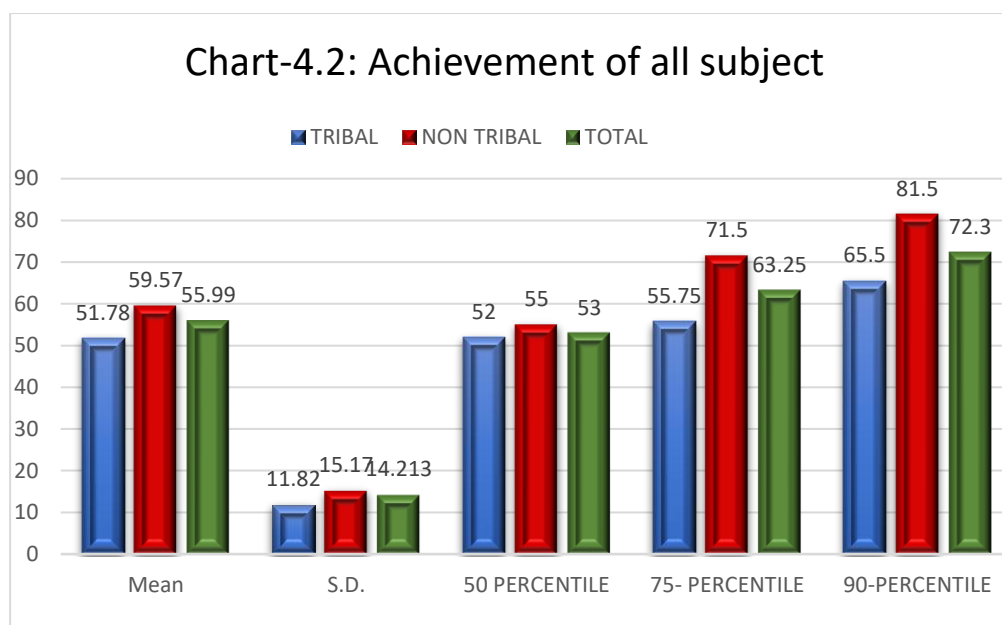
This pattern of achievement indicates that, generally, Tribal students score in the II division, whereas Non-Tribal students reach I division levels. The gap in mean performance and upper percentile scores underscores the need for targeted academic support and enrichment programs to enhance the Achievement in Mathematics of Tribal students in Class IX.

4.3.0 TO IDENTIFY FACTORS INFLUENCING STUDENTS' ACHIEVEMENT LEVELS IN MATHEMATICS SOCIO-ECONOMIC BACKGROUND, PARENTAL EDUCATION AND OCCUPATION, GEOGRAPHICAL LOCATION, ATTENDANCE RATE, AND PROBLEMS FACED BY THE STUDENTS, DISTANCE TO SCHOOL, WELL-CONSTRUCTED ROAD TO SCHOOL

The second objective of the present research was to identify the factors influencing students' achievement levels in mathematics, including various aspects of their background such as socio-economic status, parental education and occupation, geographical location, attendance rate, and problems faced by the students. The researcher used a student questionnaire designed according to these different aspects. Responses were collected by both teacher and student and compared with their achievement levels in mathematics.

To identify the factors influencing students' achievement level in mathematics, results related to various aspects of their background are presented under separate captions from 4.3.1 to 4.3.8.

4.3.1 SOCIO-ECONOMIC BACKGROUND

Understand the relationship between **socio-economic background** and **achievement in mathematics**, the students were categorized into five economic brackets, and their performance was analysed separately for Tribal and Non-Tribal groups.

Table-4.4: Income-wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	ECONOMIC STATUS	TRIBAL (N)	MEAN	SD	NON-TRIBAL (N)	MEAN	SD	TOTAL (N)	MEAN	SD
1	below 5000	34	50.44	11.12	22	52.31	10.65	56	51.17	10.88
2	5001-10000	10	54.1	15.64	8	53.25	11.24	18	53.72	13.48
3	10001-20000	1	42	-	2	39.5	2.12	3	40.34	2.08
4	20001-50000	1	78	-	14	68.64	17.67	15	69.27	17.19
5	Above 50000	-	-	-	8	79.87	14.67	8	79.87	14.67
	Total	46	51.65	12.63	54	60.29	17.12	100	56.32	15.75

From Table 4.4 examines the relationship between parents' economics status and their achievement in mathematics, with comparisons made between Tribal and Non-Tribal students across four attendance ranges.

1. Below ₹5000 Income Bracket:

Among students from families earning below ₹5000 per month, Tribal students (N=34) scored an average of 50.44 with a standard deviation of 11.12, while Non-Tribal students (N=22) scored slightly higher with a mean of 52.31 and an S.D. of 10.65. The combined average of all 56 students in this group is 51.17, indicating modest achievement levels.

2. ₹5001–₹10000 Income Bracket:

In this bracket, Tribal students (N=10) achieved a mean of 54.1 with a relatively high S.D. of 15.64, while Non-Tribal students (N=8) recorded a mean of 53.25 with lower variability (S.D. IS 11.24). The total group average (N=18) was 53.72, reflecting comparable achievement levels across both categories.

3. ₹10001–₹20000 Income Bracket:

Very few students fall in this category only 1 Tribal and 2 Non-Tribal. The Tribal student scored 42, while the Non-Tribal students had a mean of 39.5 with S.D. 2.12. The combined group average was 40.34, indicating low mathematical achievement overall in this group.

4. ₹20001–₹50000 Income Bracket:

This group showed better performance. The single Tribal student scored 78, while Non-Tribal students (N=14) scored a mean of 68.64 with a higher S.D. of 17.67. The total group average was 69.27, suggesting a positive correlation between improved economic status and higher academic performance.

5. Above ₹50000 Income Bracket:

No Tribal students belonged to this group. However, Non-Tribal students (N=8) in this highest income bracket performed very well, with a mean score of 79.87 and an S.D. of 14.67. This group recorded the highest mean score among all income categories.

Findings: Mathematics achievement increases with the economic status, especially, of Non-Tribal students, who outperform Tribal students, notably, in higher-income brackets. Tribal students, mostly, from lower-income families, show comparable performance at the base level but lag behind as income rises. Overall, a clear achievement gap exists between the higher SES and lower SES.

It indicates that performance in mathematics is influenced by SES factor.

4.3.2 PARENTAL EDUCATION

The effect of parental education on students' academic success in mathematics is a major focus of the investigation, the data has been categorized according to five educational levels i.e. Illiterate, 10th, 12th, Graduation, and other qualifications. The performance of both Tribal and Non-Tribal students has been analysed in terms of mean scores and standard deviations. Therefore, the result related to the Achievement level of mathematics results related to Parental Educational i.e. Father and Mother education each of these are presented under separate captions below as 4.3.2.1 and 4.3.2.2.

4.3.2.1 FATHERS' EDUCATION

Students were grouped based on their fathers' education to see how it affected their achievement in mathematics. The performance of Tribal and Non-Tribal students was analysed using mean scores and standard deviations across each category.

Table-4.5: Father Education Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	EDUCATIONAL STATUS	TRIBAL (N)	MEAN	S.D.	NON-TRIBAL (N)	MEAN	S.D.	TOTAL (N)	MEAN	S.D.
1	Illiterate	42	51.17	12.47	24	51.96	9.38	62	51.45	11.38
2	10th	2	53.5	2.12	6	50.33	16.06	8	51.13	13.67
3	12th	2	60	25.46	16	72.56	17.24	18	71.17	17.8
4	Graduation	0	-	-	6	64.33	21.1	6	64.33	21.1
5	Other	0	-	-	2	80	0	2	80	0
	Total	46	51.65	12.64	54	60.3	17.13	100	56.32	15.76

From the above Table 4.5 This section examines the relationship between the father's level of education and students' achievement in mathematics.

1. Illiterate Group

In this group, Tribal students (N=42) had a mean score of 51.17 and S.D. 12.47, while Non-Tribal students (N=24) scored a slightly higher mean of 51.96 and S.D. IS 9.38. The combined group average of 62 students is 51.45, indicating similar performance among students whose parents are illiterate, regardless of community.

2. 10th Pass Group

Among those whose parents studied up to 10th standard, Tribal students (N=2) had a mean score of 53.5 with very low variation which S.D. is 2.12, while Non-Tribal students (N=6) scored 50.33 with a higher S.D. of 16.06. The overall mean for this group is 51.13, showing moderate achievement without much difference between the groups.

3. 12th Pass Group

Here, Tribal students (N=2) scored an average of 60.00 and S.D. is 25.46, while Non-Tribal students (N=16) showed a significantly higher mean of 72.56 and S.D. is 17.24. The total group mean is 71.17, reflecting a strong influence of higher parental education on student performance, especially for Non-Tribal students.

4. Graduation Group

There were no Tribal students in this category. Non-Tribal students (N=6) achieved a mean score of 64.33 with an S.D. of 21.10. This shows a relatively high performance where parents are graduates.

5. Other Qualifications

This group includes non-traditional or professional education levels. Again, no Tribal students were present. Non-Tribal students (N=2) scored an average of 80.00 with no variation (S.D. IS 0.00), recording the highest mean achievement across all educational categories.

Findings: Students' mathematics achievement improves with higher parental education, especially among Non-Tribal students. Tribal students are mostly from lower educational backgrounds, showing limited representation in higher categories. As parental education increases, the achievement gap between Tribal and Non-Tribal students widens significantly. A clear achievement gap exists between the higher PE and lower PE.

It indicates that performance in mathematics is influenced by PE of Father.

4.3.2.2   MOTHERS' EDUCATION

Students were grouped based on their mothers' education to see how it affected their achievement in mathematics, students were categorized based on their mothers' education levels. The performance of Tribal and Non-Tribal students was analysed using mean scores and standard deviations across each category.

Table-4.6: Mother Education Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	EDUCATIONAL STATUS	TRIBAL (N)	MEAN	S.D.	NON-TRIBAL (N)	MEAN	S.D.	TOTAL (N)	MEAN	S.D.
1	Illiterate	45	51.07	12.13	36	56.11	13.19	81	53.31	12.79
2	10th	-	-	-	7	66.14	22.31	7	66.14	22.31
3	12th	1	78	-	6	62.67	24.01	7	64.86	22.67
4	Graduation	-	-	-	5	79.4	14.62	5	79.4	14.62
5	Other	-	-	-	-	-	-	-	-	-
	Total	46	51.65	12.64	54	60.3	17.13	100	56.32	15.76

From the Table 4.6 this section examines the relationship between the mother's level of education and students' achievement in mathematics.

1. Illiterate Group
Among students whose mothers are illiterate, Tribal students (N=45) had a mean score of 51.07 and S.D. is 12.13, while Non-Tribal students (N=36) scored a higher mean of 56.11 and S.D. is 13.19. The total group average (N=81) was 53.31, indicating moderate achievement with a noticeable performance gap favouring Non-Tribal students.

2. 10th Pass Group
No Tribal students were present in this category. Non-Tribal students (N=7) scored a mean of 66.14 with a higher variation of S.D.is 22.31, showing improved performance compared to the illiterate group and reflecting the positive influence of basic maternal education.

3. 12th Pass Group
Only one Tribal student belonged to this group, scoring 78, while Non-Tribal students (N=6) achieved a mean of 62.67 and S.D. 24.01. The total group average (N=7) was 64.86, indicating better performance where mothers have intermediate-level education.

4. Graduation Group
There were no Tribal students in this category. Non-Tribal students (N=5) scored a high mean of 79.4 with an S.D. of 14.62, representing the highest performance across all categories and highlighting the strong correlation between higher maternal education and student achievement.

5. Other
No students were recorded under this category.

Findings: Mathematics achievement increases with the educational level of the mother, especially among Non-Tribal students. Tribal students are mostly from

illiterate backgrounds, with no representation in the higher education categories, which limits their academic advantage.

It indicates that performance in mathematics is influenced by PE of Mother.

4.3.3   MAIN OCCUPATION OF HOUSE HOLD

Parents' occupation influences students' achievement in mathematics, the data was analysed across various occupational categories for Tribal and Non-Tribal students, using mean scores and standard deviations.

Table-4.7: Occupation Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	OCCUPATION	TRIBAL (N)	MEAN	S.D.	NON-TRIBAL (N)	MEAN	S.D.	TOTAL (N)	MEAN	S.D.
1	AGRICULTURE	27	50.26	12.74	19	54.47	10.86	55	52	10.91
2	DAILY WAGES & LABOR	7	57.29	15.61	1	38.00	-	8	54.88	15.6
3	GOVERNMENT	5	56.6	12.03	19	70.53	17.34	24	67.63	14.28
4	PRIVATE	0	-	-	1	78.00	-	1	78	-
5	BUSINESS	0	-	-	1	89.00	-	1	89	-
6	OTHER	1	36	-	1	28.00	-	2	32	7.07
7	AGRI & WAGES	5	49.4	8.08	6	55.33	1.03	11	52.64	6.45
8	AGRI & PRIVATE	1	52	-	3	48.00	8.66	4	49	8.49
9	AGRI & BUSINESS	0	-	-	1	38.00	-	1	38	-
10	LABOR & GOVT	0	-	-	1	93.00	-	1	93	-
11	PRIVATE & BUSINESS	0	-	-	1	41.00	-	1	41	-
	TOTAL	45	51.65	12.64	55	60.30	17.13	100	56.32	14.21

From the above Table-4.7 how the parent's occupation influences the students' achievement. Different occupational categories reflect varied socio-economic backgrounds and access to learning resources, which in turn impact student performance

1. **Agriculture**

   Tribal students (N = 27) had a mean score of 50.26 and S.D. is 12.74, while Non-Tribal students (N = 19) scored slightly higher with a mean of 54.47 and S.D. is 10.86. The combined mean (N = 55) was 52, showing modest achievement for children from agricultural families.

2. **Daily Wages & Labour**

   Tribal students (N = 7) scored an average of 57.29 and is S.D. IS 15.61, while the lone Non-Tribal student scored 38.00. The group mean was 54.88, slightly higher than the agricultural group, but the small Non-Tribal sample limits broader inference.

3. **Government Jobs**

   Tribal students (N = 5) scored 56.6 and S.D. is 12.03, while Non-Tribal students (N = 19) scored significantly higher at 70.53 and S.D. is 17.34. The combined mean was 67.63, showing that children of government-employed parents perform better academically, especially among Non-Tribals.

4. **Private and Business Sectors**

   Though only one Non-Tribal student appeared in each of these categories, they recorded very high scores—78 for private and 89 for business—indicating potential academic advantages linked to economic stability.

5. **Other Occupations**

   One Tribal and one Non-Tribal student from this category showed very low scores (36 and 28), bringing the combined mean to 32 is S.D.is 7.07, reflecting poor academic performance from unstable occupational backgrounds.

6. **Agri & Wages**

   Tribal students (N = 5) had a mean score of 49.4 and S.D. is 8.08, while Non-Tribal students (N = 6) scored slightly better with a mean of 55.33 and S.D. is 1.03, indicating very consistent performance. The total group mean (N = 11) was 52.64, suggesting average academic achievement from families engaged in both agriculture and daily wage labor. Non-Tribal students performed more consistently and slightly better than Tribal peers in this occupational group.

7. **Agri & Private**

   Only 1 Tribal student scored 52, while 3 Non-Tribal students had a slightly lower average of 48.00 and S.D. is 8.66. The total group mean (N = 4) stood at 49, reflecting below-average achievement overall. Students from Agri & Private backgrounds show modest performance, with slight advantage for the Tribal student in this small sample.

8. **Agri & Business**

   No Tribal students were represented. The sole Non-Tribal student scored 38, indicating low achievement. With just one data point, this group reflects poor academic performance, but lacks enough data for generalization.

9. **Labor & Govt**

   No Tribal students were present. One Non-Tribal student scored a very high 93, the highest across all categories. This exceptional score suggests strong academic potential when parents are engaged in both labor and government jobs, although the result is based on only one student.

10. Private & Business

Only one Non-Tribal student was recorded in this category, with a score of 41, indicating below-average performance. Despite being from potentially economically stable backgrounds, this student's low score highlights variability and suggests that occupation alone may not predict achievement.

Findings: Students whose fathers are in government, private, or business and labour & government sectors tend to achieve higher scores in mathematics, especially Non-Tribal students. Most Tribal students come from agricultural or labor backgrounds, where average achievement is lower, suggesting a PO influence on academic performance.

It indicates that performance in mathematics is influenced by PO.

4.3.4 GEOGROPHICAL LOCATION

Data from different grade levels of Tribal and Non-Tribal students were analysed using average scores and standard deviations to find out how grade level affects math achievement.

Table-4.8: Geographical Location Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	GEOGROPHICAL LOCATION	TRIBAL (N)	MEAN	S.D.	NON-TRIBAL (N)	MEAN	S.D.	TOTAL (N)	MEAN	S.D.
1	HILLY	1	75	-	4	62	22.01	5	64.6	19.93
2	PLATEAU REGION	12	56.7	13.4	4	81.5	10.87	16	62.93	16.67
3	VALLY AREAS	2	39.5	3.53	5	76.4	14.6	7	65.85	21.64
4	PLAINS	2	61.5	23.33	4	69.75	21.6	6	67	20.17
5	REMOTE/ ISOLATED	12	44.66	12.1	15	55.4	16.5	27	50.63	15.49
6	SEASONAL IMPACT ZONE	0	-	-	0	-	-	0	-	-
7	HILLY &P REGION	0	-	-	2	49	9.89	2	49	9.89
8	HILLY & REMOTE	3	50.33	11.2	3	61.66	18.5	6	56	15.07
9	P R & REMOTE	11	53.9	8.31	8	52.87	4.42	19	53.47	6.8
10	REMOTE & SEZ	3	46	0	4	55.5	22.4	7	51.42	16.67
11	HILLY & R & SEZ	0	-	-	5	52.4	8.05	5	52	8.05
	TOTAL	46	51.65	12.6	54	60.29	17.1	100	56.32	15.75

From the Table 4.8 to examine the influence of students' GL on mathematics achievement, data was analysed across various terrain types such as Hilly, Plateau, Valley, Plains, Remote, and combination zones for both Tribal and Non-Tribal students.

1. Hilly Areas

Only one Tribal student scored 75, while four Non-Tribal students scored a mean of 62 and S.D. is 22.01. The overall mean was 64.6, indicating high achievement but based on a small sample size.

2. Plateau Region

Tribal students (N = 12) scored a mean of 56.7 and S.D. is 13.4, while Non-Tribal students (N = 4) scored significantly higher at 81.5 and S.D. is 10.87. The total group average was 62.93, highlighting strong performance for Non-Tribal students

.3. Valley Areas

Tribal students (N = 2) had a low mean of 39.5 and S.D. is 3.53, while Non-Tribal students (N = 5) had a much higher mean of 76.4 and S.D. is 14.6. The total group average was 65.85, showing a large performance gap.

4. Plains

Tribal students (N = 2) mean scored 61.5 and S.D. is 23.33, and Non-Tribal students (N = 4) mean scored 69.75 and S.D. is 21.6, with a total mean of 67. Both groups performed relatively well here.

5. Remote/Isolated Areas

Tribal students (N = 12) scored a mean of 44.66 and S.D. is 12.1, while Non-Tribal students (N = 15) had a higher mean of 55.4 and S.D. is 16.5. The group average was 50.63, indicating lower performance in remote zones.

6. Seasonal Impact Zone

No students were reported from this area.

7. Hilly & Plateau Region

Only Non-Tribal students (N = 2) with a mean of 49 and S.D. is 9.89 were present here, showing moderate performance.

8. Hilly & Remote Areas

Tribal students (N = 3) had a mean score of 50.33 and S.D. is 11.2, and Non-Tribal students (N = 3) scored 61.66 and S.D. is 18.5. The combined average was 56, again reflecting a performance gap.

9. Plateau & Remote Areas

Tribal students (N = 11) scored 53.9 and S.D. is 8.31, and Non-Tribal students (N = 8) scored 52.87 and S.D. is 4.42. The group mean was 53.47, showing very similar achievement across groups.

10. Remote & SEZ (Seasonal Impact Zone)

Tribal students (N = 3) scored 46, while Non-Tribal students (N = 4) scored 55.5 and S.D. is 22.4. The overall average was 51.42.

11. Hilly, Remote & SEZ

Only Non-Tribal students (N = 5) were recorded here with a mean of 52.4 and S.D. is 8.05.

Findings: Students from plains, plateau, and hilly areas generally perform better in mathematics, with Non-Tribal students outperforming Tribal students in nearly every location. Tribal students are mostly from remote and difficult terrains, where performance is consistently lower. Tribal students, mostly, from remote and difficult terrains, show consistently lower performance, highlighting the impact of location on academic outcomes.

It indicates that performance in mathematics is influenced by GL factors.

4.3.5   DISTANCE TO SCHOOL

Students were grouped based on how far they live from school, and their math scores were compared using averages and standard deviations to see if distance affects their achievement.

Table-4.9: Distance to school Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	DISTANCE TO SCHOOL	TRIBAL (N)	MEAN	S.D.	NON-TRIBAL (N)	MEAN	S.D.	TOTAL (N)	MEAN	S.D.
1	Below 1KM	14	49.78	12.97	6	65.33	18.39	20	54.45	16.05
2	1.01-3 KM	11	54.18	14.04	15	63.53	17.47	26	59.57	16.49
3	3.01-5 KM	8	53.87	13.82	22	60.31	14.65	30	58.6	14.48
4	5.01-10 KM	11	53.45	8.20	7	57.14	24.32	18	54.88	15.86
5	10 KM above	2	32	7.07	4	46	10.45	6	41.33	11.30
	TOTAL	46	51.65	12.63	54	60.29	17.12	100	56.32	15.75

From 4.9 table examines how the distance from home to school affects students' mathematics achievement. Data is categorized into distance ranges, with mean scores and standard deviations calculated for both Tribal and Non-Tribal students.

1. Below 1 KM

Tribal students (N = 14) had a mean score of 49.79 and S.D. is 12.97, while Non-Tribal students (N = 6) scored significantly higher with a mean of 65.33 and S.D. is 18.39. The total group average (N = 20) was 54.45, showing a performance gap even at the nearest distance.

2. 1.01 – 3 KM

Tribal students (N = 11) scored an average of 54.18 and S.D. is 14.04, while Non-Tribal students (N = 15) had a higher mean of 63.53anfd S.D. is 17.47. The combined mean was 59.58, reflecting better achievement with slight increase in distance, especially for Non-Tribal students.

3. 3.01 – 5 KM

Tribal students (N = 8) scored a mean of 53.88 and S.D. is 13.82, and Non-Tribal students (N = 22) scored 60.32 and S.D. is 14.65. The overall average was 58.6, continuing the pattern of Non-Tribal students performing better across distances.

4. 5.01 – 10 KM

Tribal students (N = 11) had a mean of 53.46 and S.D. is 8.20, while Non-Tribal students (N = 7) scored slightly higher at 57.14 is S.D. is 24.32. The total group average was 54.89, indicating fairly consistent scores.

5. Above 10 KM

Tribal students (N = 2) scored 32 and S.D. is 7.07, while Non-Tribal students' (N = 4) scored 46 and S.D. is 10.46. The group average was 41.33, the lowest among all distance categories, showing that long travel distances negatively affect achievement.

Findings: Mathematics achievement declines with increased distance to school, especially beyond 10 KM, where performance is the Very lowest. Non-Tribal students consistently outperform Tribal students at every distance range, with the gap most visible in shorter distances. Distance to school is a critical factor influencing academic success, particularly for Tribal students who face greater travel-related challenges.

It indicates that performance in mathematics is influenced by Distance to school.

4.3.6   ATTENDANCE RATE OF STUDENTS

The relationship between students' attendance and their mathematics achievement was examined using attendance data and academic scores, the data was analysed due to attendance rate of student for Tribal and Non-Tribal students, using mean scores and standard deviations.

From Table 4.10 examines the relationship between students' school attendance rate and their achievement in mathematics, with comparisons made between Tribal and Non-Tribal students across four attendance ranges.

1. Below 30% Attendance

Tribal students (N = 2) had a surprisingly high mean score of 61.5 and S.D. is 17.68, while Non-Tribal students (N = 6) scored lower at 53.5 and S.D. is 10.46. The combined group average was 55.5, although the low attendance makes this an outlier with limited generalization.

Table-4.10: Attendance rate Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	ATTENDAN CE RATE	TRIBAL (N)	MEAN	S.D.	NON-TRIBAL (N)	MEAN	S.D.	TOTAL (N)	MEAN	S.D.
1	Below 30%	2	61.5	17.67	6	53.5	10.46	8	55.5	11.68
2	31-60%	27	50.63	8.87	17	52.17	8.79	44	51.22	8.77
3	61-80%	13	51.23	17.01	8	50.12	11.29	21	50.81	14.78
4	80 % above	4	55	19.02	23	71.60	18.70	27	69.14	19.33
	TOTAL	46	51.65	12.63	54	60.29	17.12	100	56.32	15.59

2. 31%–60% Attendance

Tribal students (N = 27) had a mean of 50.63 and S.D. is 8.88, while Non-Tribal students (N = 17) scored slightly higher at 52.18 and S.D. is 8.80. The overall average (N = 44) was 51.23, reflecting average achievement with modest attendance.

3. 61%–80% Attendance

Tribal students (N = 13) scored 51.23 and S.D.is 17.01, while Non-Tribal students (N = 8) had a mean of 50.13 and S.D. is 11.29. The total group average was 50.81, showing no significant difference and only marginal improvement in this bracket.

4. Above 80% Attendance

Tribal students (N = 4) scored a mean of 55 and S.D. is 19.03, while Non-Tribal students (N = 23) had a much higher mean of 71.61 and S.D. 18.70. The total group mean (N = 27) was 69.15, indicating the highest achievement among students with regular attendance.

Findings: Mathematics achievement increases with higher attendance, especially for Non-Tribal students, who excel in the above 80% category. Tribal students mostly cluster in the lower attendance brackets, with limited representation in high-attendance groups. This indicates that consistent school attendance strongly supports academic success, and targeted efforts are needed to improve Tribal students' regularity.

It indicates that performance in mathematics is influenced by regularity in school attendance.

4.3.7 PROBLEMS FACED TO REACH SCHOOL

This explores how various challenges in reaching school such as long distance, poor roads, lack of transportation, seasonal obstacles, and safety concerns affect students' mathematics achievement. Such problems can hinder regular attendance, reduce study time, and ultimately impact academic performance. The data compares the achievement of Tribal and Non-Tribal students who face different combinations of these challenges on their way to school

Table-4.11: Problem faced to reach school Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	PROBLEMS FACED TO REACH SCHOOL	TRIBAL (N)	MEAN	S.D.	NON-TRIBAL (N)	MEAN	S.D.	TOTAL (N)	MEAN	S.D.
1	No problem (NO)	24	52.29	13.32	14	68.07	18.01	38	58.16	15.86
2	Long distance (LD)	-	-	-	3	84	12.52	3	84	14.84
3	poor roads / no roads (PR/NR)	-	-	-	-	-	-	-	-	-
4	Lack of transportation (LT)	-	-	-	-	-	-	-	-	-
5	Seasonal obstacle (SO)	-	-	-	2	51	-	2	51	-
6	Safety concern (SC)	-	-	-	-	-	-	-	-	-
7	Other (O)	-	-	-	5	77.2	10.52	5	52	10.52
8	LD & PR	-	-	-	2	52	15.55	2	47.2	15.55
9	LD & LT	1	38		4	49.5	11.09	4	48	10.89
10	LD & SO	-	-	-	1	48	-	1	77	-
11	LD & SC	-	-	-	2	77	24.04	2	53	24.04
12	PR/NR & LT	1	53	-	-	-	-	1	46	-
13	LD & PR & LT	-	-	-	1	46	-	1	33.5	-
14	LD & PR & SO	1	27		3	35.66	6.81	5	48.66	7.04
15	LD & LT & SO	-	-	-	3	48.66	9.23	3	53.47	9.23
16	LD & LT & SC	12	53.5	7.63	7	53.42	3.21	19	58.8	6.24
17	LD & PR & LT &SO	1	52	-	4	60.5	9	5	47.5	8.67
18	LD & PR & LT&SC	1	46	-	3	48	8.66	4	37	7.14
19	LD & PR & SO &SC	1	37	-	-	-	-	1	56.5	-
20	LD & LT & SO &SC	4	56.5	20.61	-	-	-	4	56.32	20.6
TOTAL	-	46	51.65	12.63	54	60.29	17.12	100	56.32	15.75

From table 4.11 highlights the influence of travel-related difficulties on students' performance in mathematics. Factors such as poor road conditions, long distances, lack of transport, and seasonal or safety-related barriers can create obstacles to consistent school attendance and learning continuity. The data compares how such challenges impact the academic achievement of Tribal and Non-Tribal students differently, offering insights into how accessibility issues contribute to educational disparities

1. No Problem (NO)

Tribal students (N = 24) had a mean of 52.29 and S.D. is 13.32, while non-tribal students (N = 14) performed better with a mean of 68.07 and S.D. is 18.01. The total average (N = 38) was 58.16, indicating a significant advantage when no problems are faced.

2. Long Distance (LD)

Only non-tribal students (N = 3) reported this issue, achieving a very high mean of 84 and S.D. is 12.52. This may reflect other supporting factors, as performance is unexpectedly high despite the distance.

3–6. Poor Roads / Lack of Transportation / Seasonal Obstacle / Safety Concern (Individual Categories)

No Tribal students reported these as sole issues. Very few non-tribal students did; for example, 2 students facing seasonal obstacles had a mean of 51. Sample sizes are too small for reliable conclusions.

7. Other

Only Non-Tribal students (N = 5) reported this, with a high average score of 77.2 and S.D. is 10.52, suggesting that undefined issues might not be significantly hindering performance or could reflect other privileges.

8–20. Combined Problem Categories

Many combinations involved only non-tribal students, with mean scores ranging from 35.66 to 60.5, depending on the severity and mix of issues.

> ➢ LD & LT & SC was the most common among Tribal students (N = 12), who scored a mean of 53.5, closely matching non-tribal counterparts (N = 7) who scored 53.42, indicating shared difficulty across groups.

> ➢ LD & PR & SO affected both groups (Tribal N = 1, Non-Tribal N = 3), showing lower performance with means around 35.66 to 48.66, reflecting negative academic impact.

> ➢ Some combinations (like LD & LT & SO & SC) showed Tribal students (N = 4) with a strong average of 56.5, suggesting resilience or possible overestimation due to small sample sizes.

Findings: Students who face no problems reaching school perform significantly better in mathematics, especially Non-Tribal students. Tribal students mostly face complex combinations of distance, transport, and safety challenges, which correlate with lower achievement scores. School accessibility remains a critical barrier to equitable academic performance, highlighting the need for infrastructural and transportation support for Tribal learners.

It indicates that problemed faced to reach school, particularly in combination of LD & PR & SO, negatively influence mathematics performance, with Tribal students more frequently and severely affected.

4.3.8   WELL CONSTRUCTION ROAD TO SCHOOL

Well-constructed road to school investigates the impact of road infrastructure specifically, the presence or absence of well-constructed roads-on students' achievement in mathematics. Accessibility through reliable roads can play a significant role in school attendance, punctuality, and overall academic performance. The data compares Tribal and Non-Tribal students' mathematics achievement in areas with and without proper road facilities.

Table-4.12: Well-constructed road to school Wise Mean and SD of Achievement of Tribal and Non-Tribal Students

SL NO.	WELL CONSTRUCTION ROAD	TRIBAL	MEAN	S.D.	NON-TRIBAL	MEAN	S.D.	TOTAL	MEAN	S.D.
1	YES	41	51.48	13.01	37	63.48	18.77	78	57.17	17.01
2	NO	5	53	10.07	17	53.35	10.19	22	53.27	9.92
	TOTAL	46	51.65	12.64	54	60.29	17.12	100	56.32	15.76

From Table 4.12 analyses the influence of road quality on students' achievement in mathematics, comparing students who have access to well-constructed roads with those who do not. The data is separated by Tribal and Non-Tribal groups to observe performance variations.

1. Well-Constructed Road -YES

Among students who reported having well-constructed roads to school, Tribal students (N = 41) had a mean score of 51.48 and S.D. is 13.01, while Non-Tribal students (N = 37) scored notably higher with a mean of 63.48 and S.D. is 18.77. The total mean for this group (N = 78) was 57.17, showing that good road conditions are associated with higher mathematics achievement, particularly among Non-Tribal students.

2. Well-Constructed Road - NO

In areas lacking proper road infrastructure, Tribal students (N = 5) achieved a mean score of 53.00 and S.D. is 10.07, which is slightly lower than Non-Tribal students (N = 17) who scored 53.35 and S.D. is 10.19. The combined group average (N = 22) was 53.27, indicating overall lower performance in the absence of good roads and minimal performance gap between the two groups in such conditions.

Findings: Students attend schools through well-constructed roads perform better in mathematics, with Non-Tribal students benefiting the most. In areas without proper roads, Tribal group perform good in mathematics, good road access enhances school attendance rate and learning continuity, making it a key factor in AA.

It indicates that performance in mathematics is somewhat influenced by the condition of road connectivity to school, but not significantly.

4.4.0 ANALYSIS THE CLASSROOM TEACHING- LEARNING PROCESSES

Table-4.13: Percentage wise Analysis the Classroom Teaching-Learning Processes

Q.NO.	QUESTION	IN PERCENTAGE				
	Section 1: Classroom Environment	Poor	Fair	Good	Very Good	Excellent
1	Student participation in class	0	20	60	20	0
2	Teacher's teaching methods	0	25	65	10	0
3	Use of multimedia or teaching aid	0	50	45	5	0
4	Teacher-student interaction	0	15	70	15	0
5	Classroom organization	0	25	40	30	5
6	Teaching resources availability	5	45	25	25	0
	Section 2: Student Engagement and Behaviour					
7	Student attention and focus during the lesson	0	20	55	20	5
8	Student interaction with peers	0	30	55	5	10
9	Behaviour of students in the class	5	20	50	15	5
10	Student engagement with learning materials	0	30	60	10	0
11	Signs of motivation and interest in mathematics	0	50	40	10	0
	Section 3: Teaching Strategies					
12	Teacher's effort to address students' diverse needs	0	50	35	15	0
13	Use of real-world examples or applications in mathematics	5	35	60	5	0
14	Clarification of difficult concepts or doubts	0	40	50	10	0
15	Support for struggling students	0	25	65	10	0
	Section 4: Student Performance and Achievement Indicators					
17	Student response to questions or problems posed by teacher	0	55	40	5	0
18	Level of understanding demonstrated by students	0	30	55	10	5
19	Completion of assignments or tasks given during class	5	25	55	10	0
20	Overall classroom achievement level	0	10	70	20	0
	Section 5: Challenges					
21	Language barriers affecting understanding	0	35	50	15	0
22	Cultural factors influencing student engagement	0	15	60	25	0
23	Limited access to resources (books, materials)	0	40	55	5	0
24	Parental involvement or community support	10	40	50	0	0
25	Overall impact of challenges on student performance	5	15	75	5	0

A classroom observation was carried out to gain deeper insight into the factors affecting students' achievement in mathematics. The observation focused on five critical domains: classroom environment, student engagement, teaching strategies, student performance, and encountered challenges. Data were collected using a structured rating scale (ranging from Poor to Excellent) applied to 25 specific indicators.

From Table-4.13 this classroom observation data evaluates various aspects of teaching-learning conditions among Class IX students in the Koraput district. It is divided into five key sections: Classroom Environment, Student Engagement and Behaviour, Teaching Strategies, Student Performance, and Challenges. Responses were rated across five levels-Poor, Fair, Good, Very Good, and Excellent.

Section 1: Classroom Environment

1. Student Participation in Class: 60% reported "Good" and 20% "Very Good" participation, indicating active student involvement.

2. Teacher's Teaching Methods: 65% rated the teaching as "Good," while 25% found it "Fair." Only 10% felt it was "Very Good," suggesting moderate satisfaction.

3. Use of Multimedia or Teaching Aids: Half the responses rated it "Fair" and 45% as "Good," showing limited integration of modern tools.

4. Teacher-Student Interaction: 70% selected "Good" and 15% "Very Good," reflecting healthy classroom communication.

5. Classroom Organization: 40% found it "Good," and 30% "Very Good," but 25% saw it as "Fair." Overall, this shows decent classroom management.

6. Availability of Teaching Resources: A high 45% rated this "Fair," and only 25% said "Good" or "Very Good," indicating a shortfall in learning materials.

Section 2: Student Engagement and Behaviour

7. Attention and Focus During Lessons: 55% found student focus "Good" and 20% "Very Good," with 5% "Excellent." Indicates general attentiveness.

8. Interaction With Peers: 55% rated peer interaction "Good," but 30% said "Fair." A need to enhance collaborative learning.

9. Student Behaviour in Class: 50% marked behaviour "Good," and 15% "Very Good." The presence of "Poor" (5%) suggests occasional disruptions.

10. Engagement With Learning Materials: 60% said "Good," and 10% "Very Good." Shows active involvement with study content.

11. Motivation and Interest in Mathematics: Only 10% found it "Very Good." With 50% saying "Fair," this reflects a lack of intrinsic interest in the subject.

Section 3: Teaching Strategies

12. Addressing Students' Diverse Needs: Half the class felt efforts were only "Fair," with 35% saying "Good." More inclusive strategies are needed.

13. Use of Real-World Applications: 60% said "Good," and 5% "Very Good." Indicates some relevance to real life, but room for more contextual learning.

14. Clarification of Difficult Concepts: 50% rated this "Good," and 40% "Fair." Support in complex topics can be improved.

15. Support for Struggling Students: 65% said support was "Good" and 25% "Fair." Suggests that weaker students do receive some attention.

Section 4: Student Performance and Achievement Indicators

17. Response to Questions or Problems: 55% said "Fair," and 40% "Good." Only 5% found it "Very Good," showing limited class engagement in answering.

18. Understanding Level: 55% rated it "Good" and 10% "Very Good," indicating a decent but improvable level of understanding.

19. Task Completion: 55% rated task completion "Good," but 25% said "Fair." Indicates partial academic responsibility.

20. Overall Classroom Achievement: A promising 70% said "Good," and 20% "Very Good," reflecting moderate academic success overall.

Section 5: Challenges

21. Language Barriers: 50% said "Good" understanding despite language issues; 35% rated it "Fair," indicating moderate challenge.

22. Cultural Factors: 60% said these factors did not heavily impact learning, though 25% marked them as "Very Good" influencers.

23. Resource Access:55% marked "Good" access and 40% "Fair," showing a lack of adequate resources.

24. Parental Involvement: 40% said "Fair" and 10% "Poor," indicating low community/parental engagement.

25. Overall Impact of Challenges on Performance: A positive 75% selected "Good," suggesting that despite difficulties, students manage their academics reasonably well.

Key Findings:

- ➤ Teaching quality and classroom environment are generally rated as "Good," though resource limitations and multimedia use remain weak.

- ➤ Student engagement is moderate with good behaviour and focus, but motivation in mathematics needs enhancement.

- ➤ Teachers' strategies need more emphasis on inclusivity and real-life relevance.

- ➤ Achievement indicators suggest average academic performance with good potential for growth.