A STUDY OF ACHIEVEMENT IN MATHEMATICS OF CLASS IX STUDENTS BELONGING TO SCHEDULE TRIBAL OF KORAPUT DISTRICT, ODISHA

A DISSERTATION

Submitted to

BARKHATULLAH UNIVERSITY, BHOPAL (M.P.)

for the Partial Fulfilment of the Requirement for the Degree of

THREE-YEAR INTEGRATED B.ED. - M.ED.

for the Session: 2022-2025

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Int. B.Ed. – M.Ed. VI

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Shyamala Hills, Bhopal (M.P.)-462002

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DECLARATION

I, Pabitra Pankaj Nayak, do hereby declare that this Int. B.Ed.-M.Ed. Dissertation entitled **"A STUDY OF ACHIEVEMENT IN MATHEMATICS OF CLASS-IXTH STUDENTS BELONGING TO SCHEDULE TRIBE OF KORAPUT DISTRICT, ODISHA",** for partial fulfilment of the requirement for the degree of B.Ed.- M.Ed..

I completed this work under the guidance of **Prof. N. C. Ojha, Professor of Education,** Department of Education, **Regional Institute of Education (NCERT), Bhopal.**

I, further, declare to the best of my knowledge that this dissertation has not been submitted earlier by me or others for any Semester/Degree either in the **Barkatullah University,** or in any other University.

Place: Bhopal

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CERTIFICATE

This is to certify that Mr. Pabitra Pankaj Nayak, a student of Three-Year Integrated B.Ed. – M.Ed. course for the session 2022-2025 of Regional Institute of Education (NCERT), Bhopal has worked under my guidance and supervision for her dissertation titled **"A STUDY OF ACHIEVEMENT IN MATHEMATICS OF CLASS-IXTH STUDENTS BELONGING TO SCHEDULE TRIBE OF KORAPUT DISTRICT, ODISHA".**

I certify that this work is original and worthy of presentation in partial fulfilment of the requirement for the degree of Master of Education of Barkatullah University (M.P.).

I further certify that the work has not been submitted either partially or fully to any other university or institution for the award of any degree.

Place: Bhopal

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ACKNOWLEDGEMENT

I take this opportunity to express my gratitude to my guide, **Professor N.C. Ojha**, Department of Education, Regional Institute of Education, Bhopal, for his constant encouragement, kind support, and invaluable guidance to carry out the work presented in this dissertation. During this dissertation work, I have immensely benefited from his encouragement, guidance, and constructive criticism.

My sincere thanks to **Prof. Shiv Kumar Gupta**, Principal RIE, Bhopal, and Prof. Jaydip Mandal, Dean of Instructions, RIE Bhopal, for their inspiring cooperation and for providing a learning environment and facilities.

I am thankful to **Prof. Ayushman Goswami**, Head, Department of Education, RIE, Bhopal, for providing enough learning facilities and guidance.

I also extend my gratitude to **Prof. B Ramesh Babu**, Prof. I. B. Chughtai, Prof. Ratnamala Arya, Dr. Sanjay Kumar Pandagale, Dr. Saurabh Kumar, Dr. Manju, Dr. J.S. Borgaonkar, Dr. Triloki Prasad, Dr. Pavan Kumar, Dr. Rajesh Kumar, and Dr. Madhusudhanan P.V. as well as all the faculty members of the Department of Education, RIE, Bhopal for their affectionate care in completion of this study, my sincere thanks to all of them.

I am also thankful to **Dr P.K. Tripathy**, Deputy Librarian, and other library staff members for extending library facilities and helping in locating reference material.

I deeply appreciate the help obtained from my classmates and friends for sharing valuable insights and assistance, motivation, and support, which helped me in completing this dissertation.

Finally, and yet importantly, I take the opportunity to express my gratitude and love to my parents and beloved family members and my co-researcher, for their understanding, kind support encouragement to do my work more efficiently during crucial times of the completion of the dissertation.

Place : Bhopal

Pabitra Pankaj Nayak

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ABBERVIATION AND ACRONYMS

AA- Academic Achievement

ASER- Annual Status of Education Report

B.Ed.- Bachelor of Education

EMRS- Eklavya Model Residential School

FLN- Foundational Literacy and Numeracy

GL- Geogrophical Location

LD- Long Distance

LT- Long Distance

NAS- National Achievement Survey

NCERT- National Council of Educational Research and Training

NCFSE- National Curriculum Framework for School Education

NEP- National Education Policy

OAV- Odisha Adarsha Vidyalaya

PE- Parental Education

PO- Parental Occupation

PR/NR- Poor Road/ No Road

RIE- Regional Institute of Education

SC- Scheduled Caste

SD- Standard Deviation

SES- Socio-Economic Status

SEZ- Seasonal Effect Zone

SO- Seasonal Obstacle

SSVM- Shree Saraswati Vidya Mandir

ST- Scheduled Tribe

CHAPTER-I
INTRODUCTION

CHAPTER-I

INTRODUCTION

1.0.0 INTRODUCTION

Mathematics plays a very important role in the life of human beings. Without the knowledge of mathematics, it is difficult to learn other school subjects, more specifically science subjects. In the modern scientific world, mathematics occupies important place in the school curriculum. Every student's success in mathematics is very important for their education. It is believed that students will do better if teachers teach in a well-planned and organized way. The aim of learning mathematics should not only be solving problems but also improving students' overall problem-solving skills. Knowledge becomes truly useful when it is applied properly. To apply knowledge, students need to think clearly. So, they should solve problems with a logical and curious mindset, like a person making a new discovery.

The growth of human civilization is closely linked with the progress of mathematics and science. To keep students interested in mathematics, qualities like curiosity, motivation, imagination, creativity, and usefulness are very important. "Interest" helps students stay focused and put in effort. It is the teacher's role to help create this interest in their students. Success in school, especially academic achievement, is an important part of a student's overall development. Many factors affect academic success. Researchers have found that things like family income, gender, and education level play a big role. Other studies have looked at how intelligence, stress, anxiety, and similar factors are connected to academic performance.

In recent years, society has paid more attention to how well students do in school. Academic success has become more important among teenagers, especially in India. Academic success depends on many complex factors and cannot be explained by just one thing. Right now, the term "academic achievement" can mean different things. It could mean the knowledge a student gains after completing a course, simply passing a class, or doing well on a test. All these are seen as signs of academic success.

Our world is becoming more and more dependent on technology, which is mainly based on progress in science and mathematics. Mathematics is the base of science and technology, which have made our lives faster, easier, and more comfortable. Math is used in many areas because it helps explain complex things clearly and solve difficult problems. That's why the Kothari Commission (1966) recommended that studying mathematics should be made compulsory for the first ten years of school.

1.1.0 WHAT IS MATHEMATICS?

The Second International Congress of Mathematical Education, held on commemoration of Einstein's Birth Centenary (1933-34), has come out with the statement that

> "These fortunate beings who find Mathematics a joy and fascination will probably get on, whatever be the standard of teaching. It requires real genius of light a flicker of understanding in the minds of those, to whom Mathematics is a clouded mystery. The subject is so vitally important for everyone in this technological age, that any advance in the techniques of teaching is to be welcomed."
>
> **~Bhimasankaran, C.V**., 1981, P.1

Mathematics has its roots deep in the soil of everyday life and is basic in our highest technological achievements. Even though almost everything of a concrete character is Mathematics, it is reputed to be and actually is the most abstract and the most hypothetical of sciences.

In fact, Mathematics is a man-made science. It is the numerical and calculation part of man's life and knowledge. It helps the man to give exact interpretation to his ideas and conclusions. It deals with quantitative facts and relationships as well as with problems involving space and form. It also deals with relationships between magnitudes.

Mathematics has always held a key position in the school curriculum. because it has been considered knowledge indispensable to the educated man.

According to **Stone** (1961),

> "A whole New World of thought and understanding opens out before us to which Mathematics alone is the key."
>
> **~ Courant, Richard etc.**, 1941, P.720

Counting, notation, addition, substraction, multiplication, division, weighing, measuring, selling, buying and many more are simple and fundamental processes of Mathematics which have got an immense practical value in life.

1.2.0 MEANING AND DEFINITION OF ACHIEVEMENT

1.2.1 MEANING OF ACHIEVEMENT

Achievement means reaching a goal or completing something successfully through effort, skill, or hard work. It shows the result of what someone has done after putting in time, energy, and dedication. Achievements can be big or small, and they can happen in different parts of life, such as education, sports, work, or personal growth. In education, achievement usually refers to how well a student performs in their studies. This can be measured through exams, grades, project work, or other

school activities. For example, passing a class, scoring high marks, winning a prize, or improving in a subject are all educational achievements. Academic achievement is important because it reflects a student's understanding, learning progress, and abilities.

Achievement is not just about getting high scores. It also includes personal progress and effort. For example, a student who struggled in math but improved over time has achieved something meaningful. Similarly, completing a difficult task, learning a new skill, or overcoming a challenge are also achievements. Outside of school, achievements can be in sports, where winning a match or learning a new technique is a success. In work life, getting a job, completing a project, or earning a promotion are considered achievements. Achievement builds confidence and motivation. When people achieve something, they feel proud and are encouraged to keep trying and improving. It also helps in setting new goals and aiming higher in life.

In short, achievement is the positive result of effort and hard work. It shows growth, success, and progress in any area of life, whether big or small. Everyone has the potential to achieve, and every step forward counts as an achievement.

1.2.2 DEFINITION OF ACHIEVEMENT

Achievement in education refers to the extent to which a learner has acquired knowledge, skills, or competencies as a result of instruction and study. Several scholars have defined the concept of achievement from different perspectives:

According to **Crow and Crow (1973)**,

> ***"Achievement means the extent to which a learner is profiting from instruction in a given area of learning. Achievement is reflected by the extent to which skill or knowledge has been imparted to him"*** (p. 240).
> This highlights the learner's academic gain as a measure of effective instruction.

Bloom (1956) describes achievement as

> ***"The attainment of objectives of instruction or a set of intended learning outcomes"*** (p. 12).
> This aligns achievement closely with instructional goals and cognitive development.

Good (1973) defines achievement as

> ***"The accomplishment or proficiency of performance in a given skill or body of knowledge"*** (p. 6).
> This definition emphasizes the outcome of learning processes and the demonstration of competence.

Tuckman (1975) explains that

"Achievement refers to a student's success in meeting short- or long-term educational goals" (p. 85),
Indicating the goal-oriented nature of academic success.

Garrett (1965) considers achievement as
"The competence of a person in a given domain of knowledge or skill, as determined by standardized tests" (p. 327).
This definition underscores the role of objective testing in evaluating performance.

Popham (1975) states,
"Achievement is the degree to which a student has attained educational objectives, often measured through test scores" (p. 101).
This ties achievement to measurable outcomes of learning.

Ebel and Frisbie (1991) define achievement tests as tools

"Designed to measure the extent to which a person has learned a specific body of knowledge or acquired a specific skill" (p. 51),

Reinforcing the use of assessments in determining academic achievement.

1.3.0 TRIBAL EDUCATION IN INDIA

India being the second largest populated country in the world is a vast, multicultural, multiracial country and it occupying seventh place in terms of area. India has occupied second place next to South Africa in tribal population. Keeping in view its largeness and population, the Indian Constitution has special considerations for certain ethnic minority groups, referring traditionally tribes as Scheduled Tribes (STs) who constitute around 8.14% of the total population of the country numbering 84.51 million (2001 Census). There are 697 STs living in different parts of the country as notified by Central Government under Article 342 of the Indian Constitution. Most of the tribal communities have their own languages different from the regional languages of the state where they are located in. There are more than 270 such languages. The tribal languages in India belong to different major language families among which Austric, Dravidian, Tibeto-Chinese, and Indo-European families are the most prominent ones.

One of the distinguishing features of STs is that, the majority of them live in scattered habitations located in interior, remote, and inaccessible hilly and forest areas of the country. Nearly 22% of tribal habitations have population with less than 100 people. More than 40% have 100 to 300 people, while others have less than 500 people. Even though tribal population constitutes only 8.14% of the Indian population,

they constitute a majority in several states and union territories and sizeable population in others. In particular, they constitute an overwhelming 2 majority in Mizoram (94.75%), Lakshadweep (93.15%), Nagaland (87.70%), and Meghalaya (85.53%). However, the states of Chattisgarh, Orissa, Bihar, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, and West Bengal account for 83% of the total tribal population, even though non-tribes constitute the majority in these states. A tribe means,

"A group comprising families, alone or generation having its own customs, occupying a specific territory and being independent of or having little contact with the dominant national society of the country in which they live".

The word 'tribe' though well understood generally, but it is much complex to define precisely. There has been a difference of opinion between Anthropologists and Sociologists and also differ from one set of anthropologists to another set of anthropologists.

The tribes are defined by Indian constitution Article 366 (25) as **"Tribes or tribal communities or parts of or groups with in such tribes or tribal communities".** Due to isolation, unawareness and exploitation, tribes in India are facing economic and social problems. They live generally in forest areas along with the hill streams. Tribes in India reside in hills, deserts, forest, islands, mountains, 5 seacoasts etc. Tribes have to face a number of problems due to their isolated residences situated in remote areas. But they are emotionally attached to their lands and forest. They accept all outsiders into their territory and that creates more problems than benefits to their communities. Due to exploitation from various stakeholders tribals are now facing a lot of problems.

For promoting the welfare of scheduled tribes and for rising the level of administration of schedules and tribal areas to the state level, Article 275 of the constitution provides grants in aid from 'consolidated fund of India' to States for implementation of developmental programmes. Majority of the tribal population does not still enjoy the basic standards of good life. Preservation of tribal culture and fostering their traditional knowledge have to be ensured hand in hand with their empowerment and all-round socio-economic development.

1.4.0 KORAPUT DISTRICT – AN OVERVIEW

Koraput district is situated in the southern part of the state, Odisha. The district is a gift of nature and well known for its scenic beauty. It is famous for its lofty mountains, spreading green valleys, picturesque landscapes, swift fountains, beautiful and springing waterfalls, dense forests with varieties of birds and animals, a number of historically famous places and temples, etc. Along with all these things, the rich cultural heritage of different tribal people attracts many tourists. Further, the pleasant climate of the district is an asset for its inhabitants.

The district headquarter, Koraput town, is situated at a distance of around 500 kilometers from the state capital, Bhubaneswar. It is located between 17.4 degree and

20.7 degree North Latitude and 81.24 degree and 84.2 degree East Longitude. The district has altitude ranging between 300 meters to 1000 meters above mean sea level. Odisha's biggest Mountain peak Deomali is situated here at a height of 5486 feet above the sea level. It is the third biggest district in Odisha and covers 5.66% of the total geographical area of the State. Koraput district is surrounded by three other districts Nabarangapur, Rayagada and Malkangiri and two states, Andhra Pradesh and Chhattisgarh. The political map of Koraput district has been displayed in figure 1.1.

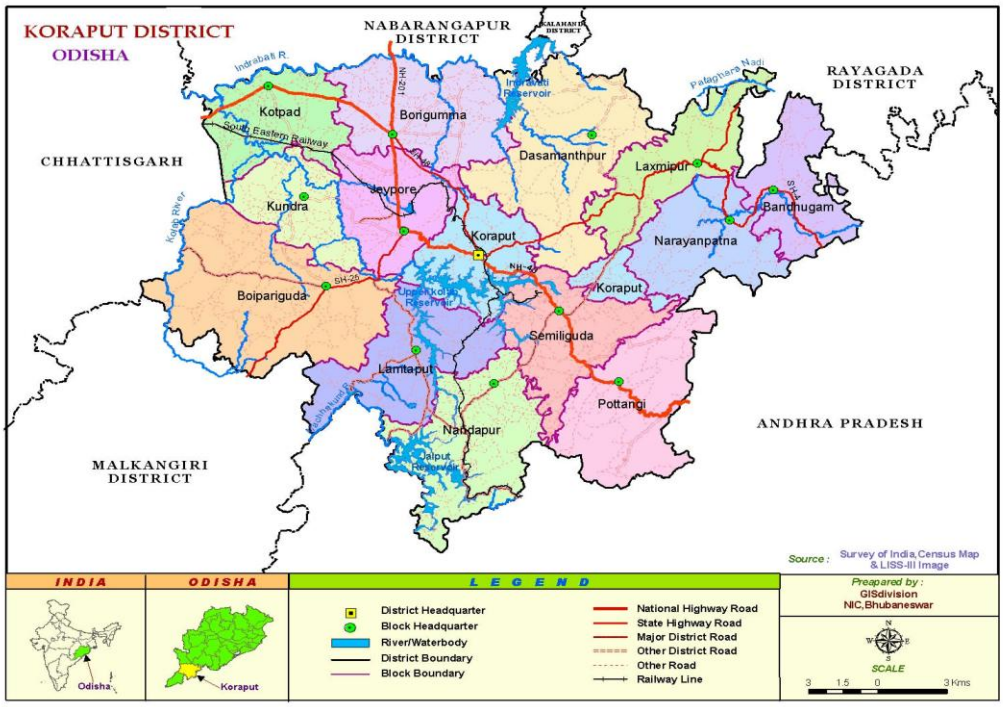


Figure-1.1: Political Map of Koraput District. (Source: NIC, Bhubaneswar)

. As per Census-2011 Koraput district has 3,36,200 numbers of households with a total population of 13,79,647 out of which male are 6,78,809 and female are 7,00,838. It ranks 15th position in Odisha in terms of population and consists 3.29% of the total population of the State. As far as the caste wise population of the district is concerned, the population of Scheduled Tribe is 50.56%, Scheduled Caste is 14.25% and population of other castes is 35.19%. The population density in the district is around 156 people per square kilometer and it is 24th densely populated districts in Odisha. The sex ratio of the district is 1032 per 1000 male and Koraput possesses 4th rank in the state. More than 83% of the total population lives in the tribal, hilly and rural area of the district. The major tribes found in the district are Paraja, Bhottoda (Bhatara) and Amanatya. In addition to these Kandha, Gadaba, Bhumia, Soura and Penthia tribes are found in the district.

Koraput is a tribal dominated district and hence its socio-cultural and economic status is mostly reflected by the tribal communities residing here. The inhabitants of the district possess a rich socio-cultural tradition and heritage. Each of the tribe possesses their own sociocultural history and they have their own language. But,

almost all of them speak and tell a common language, called the Desia Bhasa, which is a mixture of the languages of different tribes of the district and the Odia language. The economic status and characteristics of the district is primarily based upon forest and agriculture. The economy of almost all the people is of subsistence type and more than 60% of the people are living below the poverty line.

The educational status in the tribal district Koraput is not so encouraging. The literacy rate of the district is 49.21%, which is very less than the literacy rate of Odisha (72.87) and India (72.98).

Table-1.1: Literacy Rate - Koraput District

Gender	Koraput District	Odisha	India
Female	38.55%	64.01%	65.46
Male	60.32%	81.59%	82.14
Total	**49.21%**	**72.87%**	**74.04**

(Source: Census of India-2011.)

The total literacy rate of Koraput district was 49.21% in 2011 which is less than average literacy rate 72.87% of Odisha. Population-wise, out of total 568,090 literates, males were 340,843 while females were 227,247. Also the male literacy rate was 60.32% and the female literacy rate was 38.55% in Koraput district.

The literacy rate of the scheduled tribe category especially that of the scheduled tribe female (25.37%) and the literacy rate of rural area population (31.26%) is very miserable. Table 1.2 gives us a clear picture regarding total literates and the literacy rate of Koraput district.

Table-1.2: Details on Literate and Literacy Rate of Koraput District.

Area	Male	Female	Total
Rural	2,50,926 (54.14%)	1,53,499 (31.26%)	4,04,425 (42.37%)
Urban	89,918 (89.48%)	73,748 (74.90%)	1,63,665 (81.80%)
Scheduled Tribe	1,26,799 (46.20%)	75,542 (25.37%)	2,20,341 (35.36%)
Scheduled Caste	51,969 (64.72%)	34,352 (41.05%)	86,321 (52.64%)
Total	**3,40,843 (60.32%)**	**2,27,247 (38.55%)**	**5,68,090 (49.21%)**

(Source: Census of India-2011.)

Schedule Caste (SC) constitutes 14.2% while Schedule Tribe (ST) were 50.6% of total population in Koraput district of Odisha

Table-1.3: Caste-wise Population - Koraput district

Caste	Male	Female	Total
Schedule Caste	96789	99751	196540
Schedule Tribe	337373	360210	697583

(Source: Census of India-2011.)

1.5.0 SOCIO-ECONOMIC BACKGROUND OF KORAPUT DISTRICT

The purpose of this study of factors affecting academic achievement of pupils at eighth grade level was to study the impact of socio-cultural characteristics on the school achievement of tribal and non-tribal pupils. An attempt has also been made to compare the academic achievements of tribal students with those of non-tribals. And for this purpose, the tribal and non-tribal pupils of the same areas were studied.

1.5.1 SCHEDULE TRIBE OF KORAPUT

Koraput district in southern Odisha is renowned for its rich tribal heritage, with Scheduled Tribes (STs) comprising over 50% of its population-approximately 697,583 individuals as per the 2011 Census. The district is home to diverse tribal communities, including the Paroja, Gadaba, Bhumia, Chandala, Saura, Bhottada, Durua, Didayi, and Kandha Gauda, each possessing distinct languages, customs, and socio-cultural practices. forms the backbone of the tribal economy in Koraput. Communities engage in subsistence farming, cultivating crops like paddy, millets, pulses, and oilseeds. Traditional agricultural practices, such as shifting cultivation and integrated farming systems, are prevalent. Livestock management is integral, with free-range grazing and the use of indigenous breeds adapted to local conditions. Forests play a crucial role, providing non-timber forest products (NTFPs) like roots, fruits, and medicinal herbs, which supplement livelihoods and contribute to food security.

The tribal communities of Koraput have a rich cultural tapestry, with festivals and rituals deeply intertwined with agricultural cycles and natural resources. Festivals like Nuakhai Parab and Push Parab are celebrated with offerings from the harvest and communal feasts. Sacred groves, patches of virgin forests, are revered and protected as abodes of deities, reflecting the communities' deep ecological knowledge and conservation ethics.

Despite their rich heritage, the tribal populations face significant challenges. Literacy rates are notably low, and rights remain a contentious issue; many tribal families are landless due to historical dispossession. The Scheduled Tribes of Koraput are custodians of a rich cultural and ecological legacy. Addressing educational gaps, securing land rights, and integrating traditional knowledge into development initiatives are essential steps toward empowering these communities and preserving their unique heritage.

1.5.2 SOCIO-CULTURAL DIFFERENCES IN TRIBAL AND NON-TRIBAL PUPILS

In the Koraput district of Odisha, the socio-cultural differences between tribal and non-tribal pupils significantly influence their educational experiences and outcomes. Tribal pupils, who belong to communities like the Paroja, Gadaba, and Saura, often grow up speaking indigenous dialects that differ from Odia—the medium of instruction in most schools. This language gap hampers their comprehension and communication in classrooms. In contrast, non-tribal pupils typically speak Odia at home and are more familiar with formal language, giving them an advantage in academic settings. Moreover, the home environment of tribal children is often marked by low literacy and limited parental support, as many tribal parents are either illiterate or engaged in subsistence livelihoods. Education may not always be a priority due to economic constraints or cultural perceptions, leading to irregular attendance or early dropouts.

On the other hand, non-tribal pupils usually come from families that value formal education and can provide academic support or access to private coaching. Culturally, tribal children are more rooted in oral traditions, communal lifestyles, and nature-based rituals, which may not align with the structured, textbook-driven school system. This mismatch often leads to lower participation and self-confidence among tribal students. Non-tribal pupils, being more exposed to mainstream societal norms and practices, tend to adapt more easily to school routines and participate actively in academic and extracurricular activities. Addressing these disparities requires inclusive education strategies that recognize cultural diversity, support multilingual learning, and involve the tribal community in the educational process.

1.5.3 SOCIO-ECONOMIC DIFFERENCE OF TRIBAL AND NON-TRIBAL

Economic self-sufficiency vas a characteristic of tribal culture. But due to the impact of neighbouring cultures, tribals have learned new ways of life and their socio-economic set-up has been disturbed, with the result that today they are considered to be socio-economically disadvantaged and weaker people. They have to depend on supplementary occupations in which they engage their children also. The artisan Paroja, Kandha, and Saura are mostly landless and economically deprived, most of them being highly in debts. The Kandha of the Laxmipur area of Koraput are facing land problems. Their ancestral land holdings have either been snatched by neighbouring non-tribals or they have been dispossessed of their land by the State Forest Department. Even in cases where the tribels possess sufficient land, they are unable to exploit it fully because of their primitive means of exploiting the natural resources.

Thus, the tribals from outside may seem to possess good economic status, in fact, are not economically well off. The scheduled castes are also socio-economically at remarkably low position. But their problems are of different nature and mostly arising out of the tradition of untouchability which existed in past. Their traditional

occupations being less remunerative, they are economically backward. Due to lack of education, they have to practise mostly their hereditary occupations. Scheduled caste parents often prefer their children to engage in hereditary occupations rather than sending then to schools. Children of school going age are economic assets for then since their labour adds to the family earnings. In social / castes hierarchy the scheduled caste for the lowest rung.

The pupils belonging to the group of castes other than the scheduled tribes and scheduled castes is socio-economically better. They belong to the castes of comparatively higher prestige in the traditional Hindu caste hierarchy. Educationally they are more aware. Other caste people have shown such social and economic mobility, are performing better occupations and are numerically dominant in the state and also in the districts included in present study.

1.5.4 DIFFERENCES IN ACADEMIC ACHIEVEMENT

Foregoing description of socio-cultural characteristics of scheduled tribe (Paroja, Kandha, Gadaba and Saura), and non-tribal (the scheduled caste and other caste) groups of pupils demonstrated how these pupils differed with respect to the factors generally considered educationally relevant. The academic achievement of scheduled tribe and non-tribal pupils are also expected to differ because of the differences between the social position of the two. Because academic achievement is often adversely affected by lack of social acceptance. Those who are well accepted perform better than those who are neglected and much better than those who are actually rejected (Hurlock, 1983).

1.6.0 STUDENT ACHIEVEMENT IN MATHEMATICS AS PER NEP-2020

The **National Education Policy (NEP) 2020** places a strong emphasis on improving **student achievement in mathematics**, recognizing it as a foundational skill essential for logical reasoning, problem-solving, and scientific temper. The policy acknowledges that a large percentage of students in India struggle with basic mathematical concepts, which leads to poor learning outcomes in higher grades. To address this, NEP 2020 outlines several transformative strategies aimed at enhancing mathematics learning from the foundational stage through secondary education.

One of the most important goals of NEP 2020 is ensuring that all children attain **Foundational Literacy and Numeracy (FLN)** by Grade 3, including basic arithmetic and number sense. This mission is considered critical, as early understanding of mathematics forms the bedrock of future academic success. The **National Mission on Foundational Literacy and Numeracy**, launched under NEP 2020, specifically targets improvement in basic math skills through engaging, activity-based, and child-centered learning. Mathematics is not to be taught as a mechanical subject, but as a meaningful and enjoyable discipline that builds reasoning and analytical thinking. The policy further advocates for **experiential and conceptual learning in mathematics**, moving away from rote memorization. Students are to be exposed to real-life problem-

solving, puzzles, games, and hands-on activities that make mathematics interesting and relevant. NEP 2020 also stresses the need for **competency-based assessments** that test a student's understanding of concepts and their ability to apply them, rather than just recalling formulas or procedures.

Moreover, NEP 2020 encourages the **use of technology and digital tools** to personalize mathematics learning. Adaptive learning software and digital resources can help cater to the varied learning levels of students, especially those from disadvantaged backgrounds. The policy also emphasizes **teacher training** in innovative and child-friendly pedagogy, enabling educators to better support students' mathematical development.In conclusion, NEP 2020 envisions a mathematics education system that promotes clarity of concepts, enjoyment of learning, and development of critical skills. Through foundational literacy goals, hands-on and experiential learning, assessment reform, and use of technology, the policy aims to significantly improve **student achievement in mathematics** across all levels, thereby preparing students for higher studies and a rapidly evolving, knowledge-based economy.

1.7.0 STUDENT ACHIEVEMENT IN MATHEMATICS AS PER NCFSE-2023

The **National Curriculum Framework for School Education (NCFSE) 2023**, developed in alignment with the National Education Policy (NEP) 2020, places a strong emphasis on enhancing student achievement in mathematics. Recognizing mathematics as a critical discipline for logical reasoning, problem-solving, and its applications in various fields such as artificial intelligence and data science, the framework aims to make mathematics education more engaging, inclusive, and effective. The **Secondary Stage** focuses on developing students' ability to **justify claims and arguments through logical reasoning**. Students engage with advanced mathematical concepts, including mathematical modelling and algorithm development, preparing them for higher education and various career paths.

To make mathematics more relatable and reduce anxiety associated with the subject, the NCFSE 2023 recommends integrating mathematics with **arts, sports, and language**. For instance, using patterns in rangoli, origami, and architectural designs can help students appreciate the aesthetic aspects of mathematics. Assessment methods are also reformed to move beyond rote memorization. The framework suggests using **formative assessments**, including problem-solving tasks, projects, and peer assessments, to evaluate students' understanding and application of mathematical concepts.

Furthermore, the NCFSE 2023 acknowledges India's rich mathematical heritage, emphasizing the contributions of ancient Indian mathematicians like Aryabhata and Ramanujan. Incorporating these historical perspectives aims to install a sense of pride and contextual understanding among students. Overly, the NCFSE

2023 envisions a comprehensive and inclusive approach to mathematics education, aiming to develop not only computational skills but also critical thinking, creativity, and a lifelong appreciation for the subject.

1.8.0 CONCEPTUAL BACKGROUND OF THE STUDY

Considered as one of the most basic and important courses in the contemporary educational framework is mathematics everywhere. It is absolutely important for learners' cognitive development as well as for their academic performance. From basic arithmetic to sophisticated decision-making procedures, the subject is fundamental for many facets of daily life and underlies professions in science, technology, engineering, and economics. Mathematical ability is thus generally agreed to be a main sign of academic success and future employability. Nevertheless, despite its significance, many Indian students-especially those from underprivileged and socio- economically deprived areas-find it difficult to reach Achievement in Mathematics. Studies and national education polls have repeatedly revealed that the mathematical performance of rural students differs from others and tribal areas usually fall rather short of the national average. Given these students already encounter several socioeconomic and cultural obstacles in obtaining high-quality education, this trend is concerning. In this regard, knowing the achievement levels in mathematics among tribal students-especially those in isolated and underdeveloped areas-because absolutely vital in closing the educational disparity and guaranteeing fairness in the system.

Considered as one of the most educationally backward areas in India, the southern Odisha district of Koraput is mostly inhabited by tribal communities. Difficult terrain, inadequate connection, low literacy rates, and great poverty define the area. Census statistics and other government studies indicate that most of the tribal people living in Koraput reside in isolated villages with inadequate access to learning resources, certified teachers, and educational infrastructure. Particularly in disciplines like mathematics which are seen as challenging, the schools in these areas often suffer from high dropout rates, teacher absenteeism, and a lack of student motivation. Further challenges for students come from traditional tribal lifestyles, linguistic diversity, and cultural practices not always matching with mainstream curricula and pedagogical strategies. Particularly in disciplines like mathematics that call for logical reasoning and abstract thinking, these institutional obstacles cause an ongoing learning gap and poor academic performance. Tribal students in Odisha, particularly in areas like Koraput, routinely score below the expected grade-level competencies in mathematics, according past studies and national surveys including NAS (National Achievement Survey) and ASER (Annual Status of Education Report). However, this study attempts to solve a clear dearth of localized, in-depth research focusing especially on the elements influencing mathematics performance in these regions.

As the basis for secondary education and finally the high-stakes board exams, the switch to Class IX marks a turning point in a student's academic path. Students' future academic and job decisions depend much on their mathematical performance at

this level. Under this background, it becomes imperative to review the success. However, this study intends to fill the gap in localized and comprehensive research that focuses specifically on the factors influencing mathematics achievement in these areas.

Since it lays the groundwork for secondary education and, eventually, the highly competitive board exams, the move to Class IX marks a significant turning point in a student's academic career. Students' future academic and professional decisions are greatly influenced by their performance in mathematics at this point. In light of this, it is imperative to assess the Achievement in Mathematics of Class IX tribal students in Koraput. This is done not only to pinpoint academic shortcomings but also to comprehend the institutional, sociocultural, and economic factors that impact learning outcomes. The current study aims to investigate the current state of these students' Achievement in Mathematics and examine the effects of factors like gender, school type, parental education, learning environment, and the accessibility of educational materials on their performance. This study intends to offer insights that can guide curriculum design, educational policy, and intervention tactics aimed at enhancing learning outcomes in tribal areas by concentrating on a particular demographic and geographic circumstance. The study intends to add to the current conversation on inclusive education and the necessity of equity-driven educational reforms in India by conducting a thorough and empirical investigation.

1.9.0 NEED AND JUSTIFICATION OF THE STUDY

The academic achievement of students, especially in mathematics, is a crucial indicator of their educational development and future opportunities. Mathematics, as a foundational discipline, is essential for logical reasoning, problem-solving, and participation in a knowledge-based economy. Despite its importance, students from marginalized communities particularly Scheduled Tribes (STs) have historically underperformed in this subject due to a host of socio-economic, cultural, and institutional challenges.

The Koraput district of Odisha, a tribal-dominated and educationally backward region, presents a unique context where over 50% of the population belongs to Scheduled Tribes. Government reports, including Census 2011 and the NAS (National Achievement Survey), consistently reveal that literacy and academic achievement especially in mathematics remain significantly lower among tribal students compared to their non-tribal peers. This gap is exacerbated by factors such as poverty, parental illiteracy, inadequate infrastructure, distance to school, and language barriers.

This study is both timely and essential as it aims to bridge the research gap in understanding tribal students' educational challenges in mathematics. The findings will contribute to national goals of equity and excellence in education and provide data-driven insights that can inform local and regional education planning. Additionally, the study supports the broader goal of inclusive development, by

ensuring that tribal students are not left behind in the race toward academic success and societal integration.

Given this context, there is an urgent need to:

- Evaluate the current level of Achievement in Mathematics among Class IX tribal students in Koraput.
- Identify the socio-economic and educational factors that significantly influence their achievement.
- Compare academic outcomes between tribal and non-tribal students to better understand disparities.
- Support evidence-based interventions that can inform educators, policymakers, and curriculum developers.

This study is both timely and essential as it aims to bridge the research gap in understanding tribal students' educational challenges in mathematics. The findings will contribute to national goals of equity and excellence in education and provide data-driven insights that can inform local and regional education planning. Additionally, the study supports the broader goal of inclusive development, by ensuring that tribal students are not left behind in the race toward academic success and societal integration.

1.10.0 STATEMENT OF THE PROBLEM

The problem for the proposed study is worded as follows:

"A STUDY OF ACHIEVEMENT IN MATHEMATICS OF CLASS IX STUDENTS BELONGING TO SCHEDULE TRIBE OF KORAPUT DISTRICT, ODISHA"

1.11.0 OPERATIONAL DEFINATIONS OF THE KEY TERMS USED

The operational definitions of the following terms are given, below:

1. **Achievement**

   Achievement" refers to the extent to which a learner has attained the intended educational goals or learning outcomes, typically measured through standardized tests, teacher assessments, or academic grades. **Crow and Crow (1973):** *"Achievement means the extent to which a learner is profiting from instruction in a given area of learning."*

2. **Academic Achievement**

   Academic achievement is considered as key criteria to judge one's total potentialities and capacities. The term 'academic achievement' refers to the degree of level of success and that of proficiency attained in some specific areas concerning scholastic and academic works.

The researcher has used the term 'academic achievement on the basis of examination results of the students which is achieved by them in their school examination.

3. Achievement In Mathematics

In the present study mathematics achievement has been taken as the scores obtained by the students on an achievement test in mathematics school examination result score of mathematics subject. Basically, it was to test their retention and understanding of the Achievement in Mathematics.

4. Schedule Tribe

The framers of the constitution took note of the fact that certain communities in the country were suffering from extreme social, educational and economic backwardness arising out of age-old practice of untouchability and certain others on account of these primitive agricultural practices, lack of infrastructure facilities and geographical isolation, and who need special consideration for safeguarding their interests and for their accelerated socio-economic development. These communities were notified as scheduled castes and scheduled tribes as per provisions contained in ***clause 1*** of ***articles 341*** and ***342*** of the constitution respectively.

As per ***Article 366 (25)*** of constitution of India the ***scheduled tribes*** are defined as:

Such tribes or tribal communities or part of or groups within such tribes or tribal communities as are deemed under **Article *342*** to the scheduled tribes for the purposes of this Indian constitution.

5. Socio Economic Status

Socio-economic status is an economic and sociological combined total measure of a person's work, experience and of individual's or family's economic and social position related to others, based on income, education and occupation. Here the researcher has used "socio-economic status "as the household income, status of family, mentality of the family members and education and occupation of the family.

1.12.0 OBJECTIVE OF THE STUDY

1. To compare the Achievement in Mathematics of tribal and non-tribal students of class IX.
2. To compare the Achievement in all subjects of tribal and non-tribal students of class IX.
3. To identify factors influencing students' achievement levels of mathematics, including socio-economic background, parental education and occupation,

geographical location, attendance rate, and problems faced by the students, distance to school, well-constructed road from home to school.

4. To analyse the classroom Teaching - Learning Processes.

1.13.0 HYPOTHESIS

1. There is a significant difference in the achievement in mathematics between tribal and non-tribal students of class IX.

1.14.0 DELIMITATIONS OF THE STUDY

The present study is confined within certain boundaries to ensure focused and manageable research. The delimitations are as follows:

1. **Geographical Delimitation**:

   The study is limited to the **Koraput district** of Odisha. Findings from this study may not be generalized to tribal students in other districts or states.

2. **Population Delimitation**:

   The study is confined only to **tribal students**. Students from other non-tribal students are not included.

3. **Grade Delimitation**:

   The study is confined only to **IX class students**. Students from other class/ grade students are not included.

4. **Subject Delimitation**:

   The academic subject considered in this study is **Mathematics**. Achievement levels in other subjects such as Science, Social Studies, or Languages are not examined.

CHAPTER-II
REVIEW OF RELATED LITERATURE

CHAPTER-II

REVIEW OF RELATED LITERATURE

2.0.0 INTRODUCTION

Review of related literature is a crucial part of any academic research as it gives the required theoretical background and context to the current study. It assists the researcher in knowing what has been researched before in the field of focus and what gaps there are that need filling. For this research, the review for which deals with the level of achievement in mathematics among Class IX tribal students of Koraput district, the review includes a variety of literature such as learning and achievement theories, research on mathematics education, and research on tribal education in India.

Math achievement has been extensively researched in educational sciences because of its importance in the development of logical and analytical reasoning skills. Scholars have investigated the cognitive, affective, and socio-economic influences on the academic performance of students in various areas of mathematics. Apart from this, national student assessment surveys and education reports have pointed to the persistent learning deficits of the Scheduled Tribes students.The tribal educational context, particularly in geographically distant regions such as Koraput in Odisha, presents distinct challenges that affect learning. These involve a lack of infrastructure, language, socio-cultural variation, and limited mathematics exposure through everyday life. Research has also identified the shortcomings of pedagogy and the lack of culturally responsive pedagogy in tribal areas.

This chapter summarizes the current literature in these fields in order to construct a conceptual framework for the study, establish its relevance, and identify the gap it aims to address in mathematics education among tribal students. The review of literature has been conducted on the following topics e.g.

1. Studies on student achievement in mathematics
2. Studies conducted on Academic Achievement
3. Studies conducted on Tribal student

2.1.0 STUDIES ON STUDENT ACHIEVEMENT IN MATHEMATICS

There have been several studies on students' achievement in mathematics. In the following brief reviews, studies on students' achievement in mathematics have been presented.

Reddy, D.K. (2008). *Effectiveness of Teaching Methods on Mathematics Achievement.* This research examined the impact of teaching methods on students' mathematics achievement. The **objectives** of the study is to assess how different instructional strategies affect students' performance in mathematics. And the **findings**

of the study that interactive and student-centred teaching methods significantly improved students' understanding and achievement in mathematics compared to traditional lecture-based approaches.

Dhall et al. (2009). presented a study around intelligence as related to self-confidence and academic achievement of school students. The objective of the study was to explore the relationship between intelligence and academic achievement among secondary school students by taking a sample of 1000 students and found that there was a significant relationship between academic achievement and intelligence of secondary school students, there existed a significant difference between boys and girls of secondary school in terms of intelligence; there existed a significant difference between boys and girls of secondary school in terms of academic achievement.

Saha (2007). presented a study that delved around academic achievement in Mathematics in relation to cognitive styles and attitude towards Mathematics. Results showed that the boys and girls differed significantly on all the three measures under consideration. It was observed during the analysis that the field-independent boys as well as girls had excelled over the field-dependent boys and girls significantly in their achievement in Mathematics.

Saenz, M. B., Nandakumar, V., & Adamuti-Trache, M. (2023). *A Comparative Study of High School Students' Math Achievement and Attitudes: Do Math Teacher Qualifications Matter?* This study explores how math teacher qualifications affect ninth-grade students' math achievement and attitudes in the United States. The **objectives** of this study is to assess the impact of teacher credentials, including degree type and certification, on students' math performance and their attitudes toward mathematics. And the result **findings** are the research found that teacher qualifications significantly influenced student math achievement and math identity. Teachers with math degrees positively affected students' performance and self-perception in mathematics, while those with education degrees had some positive effects on students' interest in math courses.

Neha Khaiwal, Satyendra Gupta (2023). *Relationship Between Attitude Towards Mathematics and Academic Achievement of Eleventh-Class Students*. This study investigates the relationship between students' attitudes toward mathematics and their academic performance, focusing on gender-based differences. The **objectives** of the study is to explore how attitudes toward mathematics correlate with academic achievement among eleventh-grade students and to examine potential gender-based impacts. And the final **findings** are the research revealed a significant positive correlation ($r = 0.273$, $p = 0.006$) between students' attitudes toward mathematics and their academic achievement. This suggests that a more positive attitude towards mathematics is associated with higher academic performance.

Onoshakpokaiye, E. (2015). *Relationship of Study Habits with Mathematics Achievement. Journal of Education and Practice*. The **objective** is to investigate the relationship between students' study habits and their achievement in mathematics. And

the major **findings** are the study revealed a significant positive correlation between students' study habits and their mathematics achievement. Students exhibiting good study habits performed better in mathematics compared to those with poor study habits.

Raju, S. (2010). *Self-Concept and Mathematics Achievement among Secondary School Students.* This research analysed the impact of students' self-concept on their academic achievement in mathematics. To determine the relationship between students' self-perception and their performance in mathematics. ***Findings*** the study revealed that a positive self-concept was associated with higher achievement in mathematics, suggesting that boosting students' confidence could enhance their academic outcomes.

Panigrahi (2005) studied academic achievement in relation to intelligence and the socio-economic status of high school students. The study was conducted with an objective to examine the influence of intelligence and socio-economic status on academic achievement of high school students by taking a sample of 100 students from Bhubaneswar city of Orissa and found that there was a significant and positive correlation between academic achievement and intelligence; high intelligence leads to better academic success; a low positive correlation between academic achievement and socioeconomic status; there was no significant difference between boys and girls with respect to academic achievement.

Srinivasan, P.K., & Arivudayappam, P. (2004). *Attitude towards Mathematics and Academic Achievement.* This study explored the relationship between students' attitudes toward mathematics and their academic achievement. To determine how students' attitudes toward mathematics influence their academic performance. The study found a significant positive correlation between positive attitudes toward mathematics and higher academic achievement, suggesting that fostering a positive attitude can enhance performance.

Diseth (2003) compared intelligence and academic achievement of adolescent boys and girls of IX and XI class. It was ***found*** that among students of class XI, no significant difference was observed between the academic achievement of intellectually superior and intellectually very superior boys and girls. But, intellectually, the academic achievement of girls was superior to that of boys. In general, the intelligence test scores of boys were very higher than those for the girls; in the case of boys, there was a very high correlation between intelligence test scores and academic achievement whereas in the case of girls there was an average correlation.

Aswal (2001) examined the relationship among intelligence, achievement in Mathematics with different levels of socioeconomic status. The sample comprised randomly selected two hundred students of class XI from five colleges of Tehri district. Data were collected using a group test developed by Jalota and Singh to measure general mental ability and SES Scale developed by Pareek and Trivedi. The ***findings***

show that there was a significant correlation between intelligence and achievement in Mathematics, Relation between intelligence and achievement in Mathematics may vary across different levels of socioeconomic levels as three colleges reflected significant differences among different levels of SES out of living colleges in intelligence and Achievement in Mathematics.

Padmini, D. (2010). *Parental Involvement and Mathematics Achievement*. This study focused on the influence of parental involvement on students' mathematics performance. To examine how parental support and engagement affect students' achievement in mathematics. The study ***findings*** that students with active parental involvement in their studies tended to perform better in mathematics, highlighting the role of family support in academic success.

2.2.0 STUDIES CONDUCTED ON ACADEMIC ACHIEVEMENT

There have been several studies on students' Academic Achievement. In the following brief reviews, studies Academic Achievement have been presented.

Shikhatyagi, (2014), *Influence of Psycho-Social Factors on the Academic Achievements of Students,* worked on Achievement motivation, learning style, parental involvement as correlates of academic achievement of the secondary school students. They studied a total 600 students and found that parental involvement and learning style was positively correlated with academic achievement while compared to rural students, urban students were on a higher level of academic achievement. Learning style is the only variable that has direct impact on achievement motivation, parental involvement and academic achievement. This finding implies that parents and educators can improve the learning style of students through appropriate manipulation of their involvement and environment at home and school.

Vinitha G, (2016) conducted a study on Cognitive Strategies Influencing Academic Achievement of Higher Secondary School Students. The purpose of the study was to determine metacognitive awareness, learning style choice, and academic accomplishment of Coimbatore district higher secondary school students. A total of 1005 students from higher secondary schools were included in the study. The investigation was conducted using a survey approach. Data was collected using Schraw and Dennison's instrument for metacognitive awareness and a self-created tool for learning style preference. According to correlation research, there was a relationship between control of cognition and its subcomponent appraisal and students' academic success. Male students have greater metacognitive capacity than female students, and it's also worth noting that students who read the newspaper on a daily basis have superior cognition and can better manage their cognition.

S. Kaur and K. Grewal, (2021) conducted a study Academic Achievement Of 10th Class Students in Relation to Their Attitude Towards Schooling. The current study looked at the link between academic achievement and students' attitudes toward schooling in 10th grade. To fulfil the study's goal, 100 pupils from the Ludhiana district of Punjab were selected using a stratified random sample approach. Academic

Achievement and Attitudes about Schooling for Adolescents were created by Chopra using percentages of prior class marks from the 9th grade exams (2014). The data were analysed using statistical approaches such as the Coefficient of Correlation. The findings revealed that there is no significant association between adolescent academic achievement and attitude toward schooling, however there is a substantial relationship between adolescent academic achievement and school type. Additionally, there is a considerable link between adolescent academic achievement and type of school.

Daniel H. Caro, (2009), *The Role of Academic Achievement Growth in School Track Recommendations,* investigated Socio-economic Status and Academic Achievement Trajectories from Childhood to Adolescence. Although there is a definitive relationship between socioeconomic status and academic achievement, the extent to which it varies with age is unclear. This article examines how the academic success gap attributed to SES varies from childhood through adolescence using four data points from Canada's National Longitudinal Study of Children and Youth 2(ages 7 to 15). Estimates panel data analysis and hierarchical linear models show that the difference is relatively steady between the ages of 7 and 11, but grows at a faster rate between the ages of 11 and 15. This finding's theoretical arguments and policy implications are examined. (Meijs et al., 2010) conducted a study on Social Intelligence and Academic Achievement as Predictors of Adolescent Popularity. This study evaluated the impact of social intelligence and cognitive intelligence on teenage popularity in two school settings, as judged by academic success. The difference between sociometry popularity, which is a measure of acceptability, and perceived popularity, which is a measure of social dominance, was made. 512 14-15- year-old adolescents (56 percent females, 44 percent boys) from vocational and college preparation schools in North-western Europe took part in the study. In all instances, perceived popularity was connected to social intelligence but not to academic success. Academic success and social intelligence interacted to predict sociometric popularity, which was further qualified by school setting. Whereas college-bound students earned sociometric popularity by succeeding both socially and intellectually, vocational students gained popularity by excelling either socially or academically, but not both at the same time.

Muhammad et al., (2013), *A Comparative Study of Adjustment and Academic Achievement of College Students*, conducted a study on Parental Involvement and Academic Achievement: A Study on Senior Secondary Students. The present paper intended to study the effect of parental involvement on academic achievement of senior secondary students in terms of gender and locality. 200 students were selected randomly from the senior secondary schools of Jammu tehsil. The tool for collecting data was parental involvement scale developed by Vijaya Laxmi Chauhan & Gunjan Ganotra Arora (2008) and for assessing academic achievement the result of the previous exams i.e. class 11 was considered. The ***findings*** of the study brought out that there was a significant positive correlation between parental involvement and academic performance of rural and urban high school students.

Uddin, (2011), *Parental Warmth and Academic Achievement of Adolescent Children,* conducted a study on Parental Warmth and Academic Achievement of Adolescent Children. The purpose of this study was to see if there was a link between parental acceptance and adolescent children's academic achievement. The original Parental Rejection/Acceptance Control Questionnaires were adapted to the Bangla language in both mother and father versions. The questionnaires, together with a Personal Information Form, were given to 300 children in grades 7, 8, and 9 from four schools in Dhaka, the capital city. Pearson product moment correlations were used to analyse the data. The ***findings*** demonstrated that both mother and paternal warmth were linked to children's academic success. The findings have been evaluated in light of previous research.

2.3.0 STUDIES CONDUCTED ON TRIBAL STUDENT

There have been several studies on Tribal Students'. In the following brief reviews, studies on Tribal Students' have been presented.

Priti Chaudhari, (2010), *The Academic Achievement of Tribal Students of Ashram Schools of Surat District*, investigated on The Academic Achievement of Tribal Students of Ashram Schools of Surat District. Education has a restricted meaning in the Indian educational system. It is primarily concerned with existing formal educational organisations and institutionalised methods of delivering knowledge to individuals. There are several subgroups of people with particular needs inside this system, and tribal people are one of them. The government of India has a significant challenge ahead of them in terms of tribal education. Residential schools, often known as Ashram schools in India, are one unique education input for tribal education. These institutions represent one-of-a-kind efforts in the area of indigenous education. The research of the current state of education in ashram schools will provide empirical data on the state of Tribal education in these institutions. Such information also aids in the evaluation of indigenous education programmes. It would be interesting to learn about the academic achievements of indigenous pupils at ashram schools from this perspective. ***Findings*** of this study Academic achievement of tribal kids in Surat district's Ashram Schools was found to be average in Gujarati Hindi, Social Science and Mathematics, but below average in English and Science and Technology. As a result, it was necessary to investigate the reasons behind their disparities in academic performance across topics. The state and quality of inputs, as well as the running of schools with a substantial ST population, are not promising, according to the research. At addition, the quality of education in ashram schools must be improved.

Andrabi (2016) explored the academic achievement of tribal and non-tribal adolescent students in secondary schools of the Kashmir division. The sample was comprised of 564 students randomly selected from three secondary schools. Academic achievement was obtained from the school records of the sample students. Gender-wise and category-wise comparisons were done using mean, S.D., and independent samples t-tests. Results showed that tribal and non-tribal adolescents differ significantly on the measure of academic

achievement at 0.001 level. ***Findings*** of this study non-tribal adolescents were found to have a higher level of academic achievement than tribal students. The study also revealed that there is no significant difference between male and female adolescents on the measure of academic achievement.

Dr. M.S. Talawar Mrs. Anindita Das (2014), *A Study of Educational Development of Tribal Women of Jammu and Kashmir*, conducted A Study of Relationship Between Academic Achievement and Mental Health of Secondary School Tribal Students of Assam. The purpose of this study was to look at secondary school tribal students' academic achievement in connection to their mental health. The researcher chose 200 secondary school pupils who were diverse in terms of gender and location. Mercy Abraham and K.C. Baby Prasanna's mental health scale was utilised as a tool, and scholastic success scores were collected from school. The association was discovered using Pearson's product moment correlation, and the significance of differences between variables was determined using the t' test. According to the **findings**, there is a link between academic success and mental health among Assam's secondary school tribal pupils. The study also discovered that there is a substantial disparity between boys' and girls' mental health, urban and rural secondary school tribal students of Assam.

Kumari (2019). A study of academic achievement among tribal and non-tribal adolescents of secondary schools in the Kashmir division, and reported a significant difference in the academic achievement of tribal and non-tribal students. Non-tribal adolescents were **found** to have a higher level of academic achievement than tribal students. Significant differences were also found between male and female adolescents in their academic achievements

Dr. Charlotte Regena John, Prof. B.G. Singh, (2014) Research, *A Study of Achievement in English of Tribal Students: Comparison of Determinants,* explores effect of personality and emotional intelligence on academic achievement of tribal students. Results imply friendliness, interpersonal management, decisiveness, emotional stability, masculinity, heterosexuality, dominance as important predictors in achievement. Tribal take longer time to unfold their abilities as they are deprived of opportunities this may result in intellectual deficiency. Understanding of the role of personality enables teachers to ensure academic success.

Azad Ahmad Andrabi, (2018), *Development of Education of Scheduled Tribes in Jammu and Kashmir*, conducted A Study of Academic Achievement Among Tribal and Non-Tribal adolescents of Kashmir. This study looked at the academic achievement of tribal and non-tribal adolescent students in Kashmir division secondary schools. A total of 564 students were chosen at random from three secondary schools for the study. Academic achievement was determined using the sample students' school records. Mean, S.D., and independent samples t-tests were used to compare gender and category differences. At the 0.001 level, the results

demonstrated that tribal and non-tribal adolescents differ significantly on a measure of academic achievement. Academic achievement was shown to be higher among non-tribal adolescents than among tribal students. The study also found that there is no statistically significant difference between male and female adolescents on the measure of academic achievement.

Gadatia & Mohalik, (2016), *Home Grown Development: The Education of Tribal Peoples*, conducted a study on Life skills need assessment among tribal students at secondary level. The purpose of this study was to look at the life skills training needs of tribal students in secondary school. CSI Tribal School, Gudallur, used the survey technique with a sample of 88 secondary tribal students and 22 instructors. Data was collected using a self-developed life skill need assessment check list for students and a self-developed life skill need assessment check list for instructors. Frequency and percentage were used to analyse the data. The majority of student and instructor replies suggested that tribal pupils needed life skills education, particularly in areas like as self-awareness, effective communication, interpersonal relationships, and so on. The findings of this study have clear consequences for parents, teachers, and counsellors when it comes to planning, organising, and implementing life skills education in tribal communities.

Karyn Paringatai, (2016), *Home Grown Development: The Education of Tribal Peoples,* studied Māori identity development outside of tribal environments. Participation and adherence to a shared belief system, knowledge of ancestry, geographical location, and associated historical facts all contribute to ethnic identity formation. Mori epistemological systems were upset by the arrival of Europeans in New Zealand and the changes that ensued. The relevance of Mori language and culture to Mori people was influenced by sustained, protracted, and regular contact with other nationalities. Before going into ethnic identity, this article examines the elements that influence identity development. This will be followed by a discussion of these aspects in connection to the formation of a Mori identity. It will conclude by looking at some of the consequences of growing up away from tribal regions on the development of first-generation urban Mori born in Southland, based on study conducted with first-generation urban Mori born in Southland.

CHAPTER-III
METHODOLOGY

CHAPTER-III

METHODOLOGY

3.0.0 INTRODUCTION

The background, objectives and the rationale of the study along with the delimitations of the study are presented in Chapter 1. The reviews of related literature are presented in Chapter II along with the summary. In the present Chapter, the methodology, sample, tools, the procedures of data collection and the techniques of analysis of data of the study are presented under separate heading, below

3.1.0 METHODOLOGY

Researches in the field of academic achievement have employed different methods of study for investing different relationships. Method of research is also determined by the theory and objectives of the problem to be studied. The problem to be investigated for the present study concerns with academic achievement of scheduled tribe secondary school students in relation to their home environment, school environment and study habits.

The descriptive survey method is used in the present investigation. It describes the current position of the research work. It involves interpretation, comparison, measurement, classification, evaluation and generalization. All these direct towards a proper understanding solution of significant educational problem.

3.2.0 RESEARCH DESIGN

"***A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure.***" In fact, the research design is the conceptual structure within which research is conducted, it constitutes the blueprint for the collection, measurement and analysis of data. Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used for their analysis keeping in view of the research objectives.

Design of the study is an essential part of a research project. Because design provides a picture of what and how to do the work before starting. It has been determined from time to time that a suitable research design guards against the collection of irrelevant data and grate more economy. So, in any research project, design provides the researcher a blueprint of research which dictates the boundaries of project and helps in controlling the experimental, extraneous error, variances of the problem under investigation etc.

3.3.0 POPULATION AND SAMPLE OF THE PRESENT STUDY

The population and the sample taken for the study is presented as under.

3.3.1 POPULATION

The target population for the study consisted of Class IX tribal students of secondary schools in Koraput district, Odisha. The sample included both these students and their teachers.

3.3.2 SAMPLE PARTICIPANT

Sampling is very important and crucial part of behavioural research. It is indispensable to educational research. The research work cannot be undertaken without the selection of sample. The study of entire target population is practically not possible. Cost, time and other factors come in the way of studying of the total target population. Sampling makes the research feasible within the available resources.

David S. Fox (1969) remarks, "It is not possible to collect data from every respondent relevant to our study, but only from some fractional part of the respondents. This process of selecting the fractional part is called sampling.

Table – 3.1: School wise Distribution of sample Teachers and Students

Sl. No	Name of the School	No. Student	No. Teacher
1	Govt. High School Koraput	5	1
2	Govt. Ug High School Nandigaon	5	1
3	Govt. Ug High School Borigumma	5	1
4	Shri Aurobindo School	5	1
5	Govt. High School Padwa	5	1
6	OAV Parajapukki	5	1
7	SVBV School Koraput	5	1
8	Govt. High School Dolopur	5	1
9	Govt. High School Dasmantpur	5	1
10	EMRS Pungar	5	1
11	Sangana High School Laxmipur	5	1
12	PM Shree KV Koraput	5	1
13	J E L C High School Jeypore	5	1
14	Govt. SSD High School Panchada	5	1
15	SSVM Mathalput	5	1
16	Govt. High School Kamta	5	1
17	Govt. High School Nandpur	5	1
18	OAV Jayantgiri	5	1
19	Modern School Jeypore	5	1
20	Anand Niketan School Lamtaput	5	1
	Total	**100**	**20**

The target population will consist of IX class tribal students enrolled in 20 schools across the Koraput district. Random sampling technique was employed for the study. Twenty secondary schools of Koraput, Odisha were selected for the study. As the study was related to the secondary school teacher and the students, so 20 teachers and 100 students, including were the sample for the study. The details description of the sample is given in Table – 3.1.

3.3.3 SAMPLE SIZE

Keeping in view the objectives as well as design of the study, approximately 100 students and 20 Teacher will be surveyed to obtain a reliable dataset.

3.3.4 SAMPLING METHOD

A stratified random sampling technique will be used to select participants from different schools to ensure representation from various tribal communities.

3.4.0 VARIABLES OF THE STUDY

There are Eight independent variable and one dependent variables in this study which are as under:

3.4.1 INDEPENDENT VARIABLES

These are the factors that may influence or effect the student's mathematics achievement.

i. socio-economic background
ii. Parental education
iii. Parental occupation
iv. Geographical location
v. Attendance rate
vi. Problems faced by the students
vii. Distance to school
viii. Well-constructed road to school

3.4.2 DEPENDENT VARIABLE

i. Student Academic Achievement

3.5.0 TOOLS AND TECHNIQUES OF DATA COLLECTION

The following tools will be used for the study:

i. Questionnaire for Student
ii. Classroom Observation Schedule

3.6.0 PROCEDURE OF DATA COLLECTION

To collect the data, the researcher took written permission from the District Education Officer, Heads and Principals of the selected schools. Before using the tools, the purpose of the study was explained to them in advance in a clear and simple manner. This helped the teachers and students to participate honestly and without any hesitation. The written permission was properly signed by the concerned authorities.

The investigator requested the Principals/Head of the sample schools to grant permission to conduct the work. Before the collection of data in each sample school, one day spent in rapport establishment with the students. The objectives of the tests were explained to the students. They were taken into confidence that these tests will not affect in any way their annual results and the answers given by them will be kept confidential. The help of the concerned teacher was solicited to enlist the responses from the respondents and for proper administration of the test.

3.7.0 STATISTICAL TECHNIQUES USED FOR ANALYSIS OF DATA

Keeping in view the objectives as well as design of the study, Percentage, Percentiles, Mean, and SD will be employed for the analysis of data. Qualitative analysis will be done for the data related to the Observation Schedule.

The analysis and interpretations of the data are presented in Chapter- IV.

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.

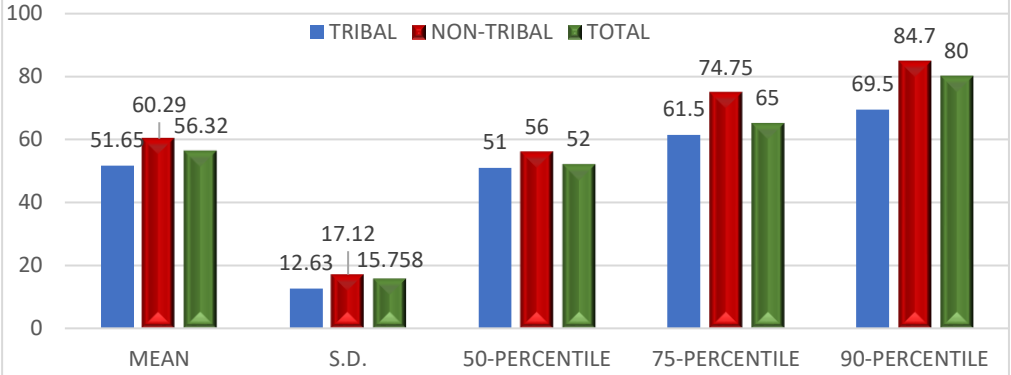
Table – 4.1: Mean, SD, Percentile of Mathematics Mark of Tribal and Non-Tribal Students

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.

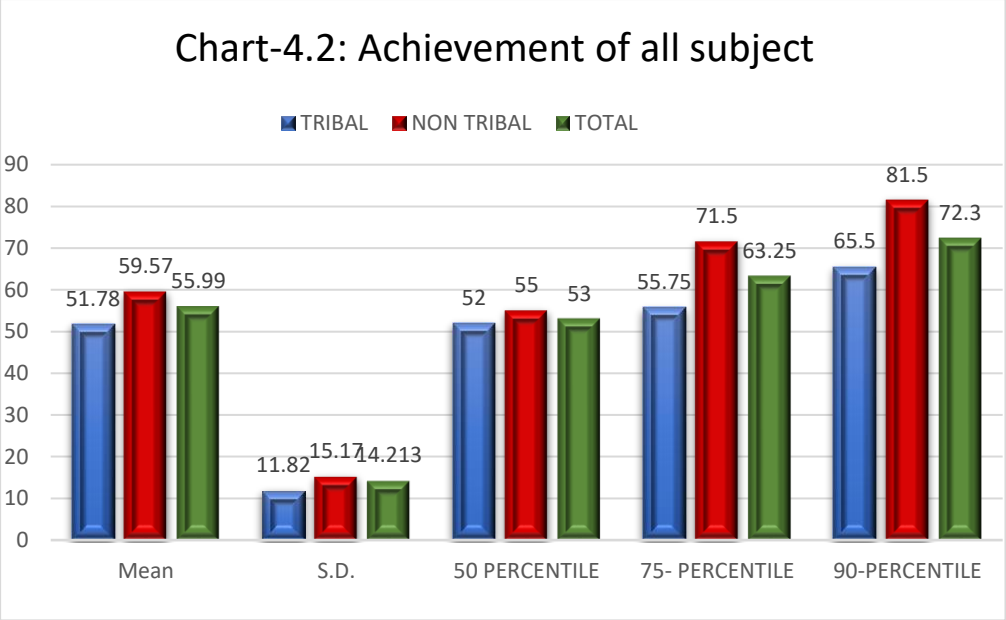
4.2.0 COMPARISON OF ACHIEVEMENT ALL SUBJECTS OF TRIBAL AND NON- TRIBAL STUDENTS IN CLASS IX

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.



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.	ATTENDANCE 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.

CHAPTER-V

DISCUSSION OF THE RESULTS, SUMMARY, IMPLICATIONS, AND SUGGESTIONS FOR FURTHER STUDIES

CHAPTER-V

DISCUSSION OF THE RESULTS, SUMMARY, IMPLICATIONS, AND SUGGESTIONS FOR FURTHER STUDIES AND CONCLUSION

5.0.0 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 chapter-IV. The present chapter deals with the findings, discussions and the conclusions.

5.1.0 MAJOR FINDINGS OF THE STUDY

Findings of the present study are presented, below:

1. It indicates that there is a significant difference in the achievement levels in mathematics between Tribal and Non-Tribal students in Class IX in Koraput district.
2. There is a significant difference in the mathematics achievement of tribal and non-tribal students based on their SES factor.
3. It indicates that there is a significant difference in mathematics achievement of tribal and non-tribal student based on their both Father and Mother education level.
4. It indicates that there is a significant difference in mathematics achievement of tribal and non-tribal student based on their PO factor.
5. It indicates that there is a significant difference in mathematics achievement of tribal and non-tribal student based on their GL factor.
6. It indicates that there is a significant difference in mathematics achievement of tribal and non-tribal student based on their Distance to school.
7. It indicates that there is a significant difference in mathematics achievement of tribal and non-tribal student based on their Attendance rate.
8. It indicates that there is a no significant difference in mathematics achievement of tribal and non-tribal student based the problems they face in attending or learning at school.
9. It indicates that there is a no significant difference in mathematics achievement of tribal and non-tribal student based on their Student Attendance rate through well-constructed roads.

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

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

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

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

5.2.0 DISCUSSION OF THE RESULT

The discussions of result related to Academic Achievement among the Tribal and Non-Tribal students in Mathematics is given below, under, separate headings.

5.2.1 ACADEMIC ACHIEVEMENT AMONG THE TRIBAL AND NON-TRIBAL STUDENTS IN MATHEMATICS

From Table 4.1 the mean AA of Mathematics score of Tribal students is 51.65 and that of non-Tribal students is 60.29. The mean AA score of the non-Tribal students' is found to be higher than the mean AA score of Tribal students which indicate that community (Tribal/Non-Tribal) does have an influence in making a person average achiever. It indicates that there is a significant difference in the achievement levels in mathematics.

From table 4.2 reveals that t-value is **2.829**. This value is significant at **0.01** level with df equal to **1/98**. 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.

Therefore, ***finding*****:** *There is a significant difference in Achievement in Mathematics of Tribal and Non-tribal students.*

The findings of this study also supported by Singh (1977), Pandey (1981), Mehta, C. P. (1987), Ekka, E. M. (1990), Indra (1991), Kalita, P. C. (2000), John, V. S., et. al (2011), Acharya, S. (2012),V. V. Kulkarni, V.V. &Shivagunde, S. (2012), Muthukumar, U; Tamilenthi. S. (2013).

These studies established that community does have an influence in making a person high achiever.

5.2.2 ACADEMIC ACHIEVEMENT AMONG THE TRIBAL AND NON-TRIBAL STUDENTS IN ALL SUBJECT

From Table 4.1 the mean Academic Achievement of all subject score of Tribal students is 51.78 and that of non-Tribal students is 59.57. The mean AA score of the non-Tribal students is found to be higher than the mean AA score of Tribal students

which indicate that community (Tribal/Non-Tribal) does have an influence in making a person average achiever. It indicates that there is a significant difference in the achievement levels in mathematics.

The findings of this study also supported by Clemens and Oleke (1967), Emekel (1984), Koteswara, N. M.(1991), Garg, Chitra(1992), Mishra, B. B. (1997). Nathanap, G. (2007), Gurubasappa (2009), Devi, B.(2013), Raju, S. S.(2013), and Siddi, R. S. (2013).

Academic Achievement of Non-Tribal students was better than the Tribal students.

5.2.3 COMPARISION THE RELATIONSHIP BETWEEN SES AND AA

It is a fact that there are various socio-economic factors that influence the academic achievement of the students individually or collectively. From the Table 4.3.1 The AA mean of Total Tribal students is 51.56 and AA mean of Total Non-Tribal students is60.29. It indicates that performance in mathematics is influenced by SES factor.

Socio-Economic Background and Acadernic A achievement of the students is highly related. The present studies supported by numerous studies; main among them are Clemen and Oleke (1967), Duncan et. al (1972), Wiseman (1973), Saini (1977), Singh (1977), Friedrich, C.(1978), Hunt (1978), Ojha, P. K (1979), Bloom (1980), Kolwadkar (1980), Sogbetan (1981), White, K.R.(1982), Hassan (1983), Emeke (1984), Grewal (1985). Misra, M. A (1986), Gupta (1987), Rawat, G. S (1987), Gill and Sidhu (1988), Ganguly, M (1989), Maqsud. M. et. al (1991), Panda, B.N (1991), Peterson, L (1991). Tripathy. P. K. (1991), Wango (1991), Wnagoo and Khan (1991), Chand. S. K (1992), Garg, V. P. and Chaturvedi (1992), Harikrishnan, M (1992), Shah, M. et. al (2012), Suleman, Q et. al (2012), Teodor, M (2012), Doren, C. J (2013), Okioga, C. K (2013), Pourfeiz, J et al (2013). ***These studies shown that Socio-Economic Status largely effect on the academic achievement of the students***.

But some of studies are not agree with this finding. The studies of George (1987), Rajput (1989), Padhan, G (1990), Mishra, B. B (1997), Panda, M (1998), Adsul, R. K and Kamble, V (2008), Pandeyet. al (2008), Adeyemo, S. A et. al (2012). K. Karthigeyan, et.al(2012) ***revealed that SES and academic achievement has no relation.***

5.2.4 COMPARISION THE RELATIONSHIP BETWEEN PARENTAL EDUCATION AND ACADEMIC ACHIEVEMENT

From the above Table 4.2.2.1 and Table 4.2.2.2 the analysis of the data reveals that 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 PE increases, the achievement gap between Tribal and Non-Tribal students widens significantly.

These findings are in line with earlier research conducted by scholars like Sewell & Hauser (1980), Coleman et al. (1966), Davis-Kean (2005), Dubow, Boxer & Huesmann (2009), and Sirin (2005), which have consistently demonstrated a strong positive relationship between parental education and students' academic achievement. Similar results were also reported by Indian researchers such as Aggarwal, Y. (2000), and Ramachandran, V. (2003), ***who found that students from educated family backgrounds generally perform better academically***.

Hence, the present study reinforces the view that **PE has a significant impact on students' AA,** supporting the hypothesis that socio-educational background, especially parental education level, plays a decisive role in shaping academic outcomes.

5.2.5 COMPARISION THE RELATIONSHIP BETWEEN OCCUPATION AND ACADEMIC ACHIEVEMENT

The present study reveals that **parental occupation (PO) has a significant influence on the academic achievement (AA) in mathematics** of Class IX students in Koraput district. The data indicates that **tribal and non-tribal students whose parents are engaged in government jobs, teaching, business, or other skilled occupations tend to perform better** in mathematics compared to those whose parents are involved in agriculture, daily wage labor, or other unskilled forms of work.

These findings are supported by Mehta (1995), Bradley & Corwyn (2002), Hill et al. (2004), and Dash & Behera (2011), who established that parental occupation directly affects students' academic outcomes. Indian research also supports the view that children of parents in formal employment tend to achieve better academic results than those whose parents are in informal or low-income occupations.

Therefore, it is evident that **parental occupation is a crucial socio-economic factor influencing mathematical achievement**, and the gap between tribal and non-tribal students in this context may be partly attributed to occupational differences. This has important implications for policy interventions aimed at improving educational equity in tribal regions.

5.2.6 COMPARISION THE RELATIONSHIP BETWEEN GEOGROPHICAL LOCATION AND ACADEMIC ACHIEVEMENT

The present study highlights that geographical location plays a significant role in determining the academic achievement (AA) in mathematics among Class IX students in Koraput district. The findings indicate that students residing in urban and semi-urban areas tend to achieve higher in mathematics than those living in remote rural or tribal regions. On the other hand, students in geographically isolated tribal regions frequently face challenges like poor school infrastructure, limited access to quality teaching, inadequate transportation, low parental literacy, and socio-economic hardships.

The tribal students living in interior areas of Koraput district are particularly disadvantaged due to poor road connectivity, limited exposure to modern education

methods, and lack of educational awareness in families. These factors significantly hinder their academic progress, especially in subjects like mathematics, which require consistent support and resources.

The present findings are supported by earlier studies such as those by Naik (1972), Govinda & Bandyopadhyay (2010), and Pradhan (2013), which emphasized that students' geographical location, especially those from backward and tribal areas, directly affects their academic performance. Studies by Singh & Chaudhary (2011) and Rao (2014) ***also pointed out that urban-rural disparities in education remain a persistent challenge in achieving educational equity in India.***

Thus, it is evident that geographical location significantly influences mathematics achievement, and the gap between tribal and non-tribal students may also be interpreted through the lens of location-based educational disadvantage. Bridging this gap requires focused policy measures such as improving school infrastructure in tribal areas, training rural teachers, increasing community awareness, and providing additional academic support to tribal students.

5.2.7 COMPARISION THE RELATIONSHIP BETWEEN DISTANCE TO SCHOOL, ATTENDANCE RATE, PROBLEM FACED AND ACADEMIC ACHIEVEMENT

The findings of the present study indicate that factors such as distance to school, attendance rate, and problems faced by students have a strong influence on their academic achievement (AA) in mathematics. The data shows that students who travel longer distances to reach school, particularly from remote and interior tribal villages, tend to have lower achievement in mathematics compared to those who reside closer to their schools.

Students in tribal areas of Koraput district often face geographical barriers, including hilly terrain, poor roads, and lack of reliable transportation, which significantly affect regular school attendance. The study finds that irregular attendance due to long travel, seasonal migration of families, household responsibilities, or poor health infrastructure leads to academic gaps, especially in a subject like mathematics that requires consistent instruction and practice. Tribal students face multiple challenges, such as lack of learning materials, insufficient parental support, language barriers, and limited access to private tuition or remedial help. These issues compound over time and contribute to the lower academic achievement of these students when compared with their non-tribal counterparts, who may live in better-connected areas and enjoy more academic support.

These findings are supported by national-level research studies. Govinda and Bandyopadhyay (2011) reported that children from disadvantaged communities and remote areas have higher rates of absenteeism and dropout due to distance and accessibility issues. Mehta (2005) and Ramachandran et al. (2004) emphasized that attendance and learning levels are positively correlated, and that school proximity plays a crucial role in ensuring regular participation. Studies by PROBE (1999) and Tilak

(2002) also confirm that school distance and socio-economic constraints remain major hurdles to educational equity in tribal areas.

Thus, it can be concluded that distance to school, irregular attendance, and problems faced by tribal students significantly hinder their academic achievement, particularly in mathematics. Bridging this achievement gap requires systemic interventions like building more schools in remote tribal regions, providing transport facilities, offering residential schooling options, and ensuring sustained academic support.

5.2.8 ANALYSIS THE CLASS ROOM TEACHING-LEARNING PROCESSES

The present study aimed to assess and analyse the classroom teaching–learning processes in mathematics among Class IX students belonging to Scheduled Tribes in the Koraput district of Odisha. Based on classroom observation and stakeholder responses, it was found that the overall teaching quality and classroom environment were rated as "Good" by the majority of respondents, indicating a relatively supportive and functional learning atmosphere. Elements such as teacher–student interaction, classroom discipline, and student participation contributed positively to the teaching-learning experience.

The study also highlights key limitations-particularly regarding availability of teaching resources and integration of multimedia or modern teaching aids. A substantial proportion of respondents rated these areas as "Fair," which suggests that despite a well-managed classroom, the pedagogical approach remains largely conventional and under-resourced. The limited use of digital tools and concrete teaching materials is a major concern, especially in tribal regions where students may benefit more from visual and contextualized learning aids.

These findings are consistent with earlier studies by NCERT (2006), Mehta (2005), Ramachandran (2003), and UNICEF (2014), which confirm that classroom learning in tribal and rural areas is often constrained by teacher training gaps, limited infrastructure, and insufficient student motivation. Scholars like Govinda & Bandyopadhyay (2010) and PROBE (1999) also emphasized the importance of improving teacher strategies and classroom resources in remote educational settings.

Therefore, it can be concluded that while the classroom environment in tribal regions of Koraput is moderately conducive to learning, significant attention must be given to improving instructional practices, ensuring availability of teaching resources, and designing culturally responsive pedagogy. Such measures are essential to enhance mathematics learning outcomes and bridge the achievement gap among tribal students.

5.3.0 SUMMARY

The summary of the present research study is presented under the following captions

5.3.1 STATEMENT OF THE PROBLEM

The problem for the proposed study is worded as follows:

"A STUDY OF ACHIEVEMENT IN MATHEMATICS OF CLASS IX STUDENTS BELONGING TO SCHEDULE TRIBE OF KORAPUT DISTRICT, ODISHA"

5.3.2 CONCEPTUAL BACKGROUND OF THE STUDY

Considered as one of the most basic and important courses in the contemporary educational framework is mathematics everywhere. It is absolutely important for learners' cognitive development as well as for their academic performance. From basic arithmetic to sophisticated decision-making procedures, the subject is fundamental for many facets of daily life and underlies professions in science, technology, engineering, and economics. Mathematical ability is thus generally agreed to be a main sign of academic success and future employability. Nevertheless, despite its significance, many Indian students—especially those from underprivileged and socio- economically deprived areas—find it difficult to reach Achievement in Mathematics. Studies and national education polls have repeatedly revealed that the mathematical performance of rural students differs from others and tribal areas usually fall rather short of the national average. Given these students already encounter several socioeconomic and cultural obstacles in obtaining high-quality education, this trend is concerning. In this regard, knowing the achievement levels in mathematics among tribal students—especially those in isolated and underdeveloped areas— because absolutely vital in closing the educational disparity and guaranteeing fairness in the system.

5.3.3 NEED AND JUSTIFICATION OF THE STUDY

The academic achievement of students, especially in mathematics, is a crucial indicator of their educational development and future opportunities. Mathematics, as a foundational discipline, is essential for logical reasoning, problem-solving, and participation in a knowledge-based economy. Despite its importance, students from marginalized communities particularly Scheduled Tribes (STs) have historically underperformed in this subject due to a host of socio-economic, cultural, and institutional challenges.

The Koraput district of Odisha, a tribal-dominated and educationally backward region, presents a unique context where over 50% of the population belongs to Scheduled Tribes. Government reports, including Census 2011 and the NAS (National Achievement Survey), consistently reveal that literacy and academic achievement especially in mathematics-remain significantly lower among tribal students compared to their non-tribal peers. This gap is exacerbated by factors such as poverty, parental illiteracy, inadequate infrastructure, distance to school, and language barriers.

5.3.4 OBJECTIVE OF THE STUDY

1. To compare the Achievement in Mathematics of tribal and non-tribal students of class IX.
2. To compare the Achievement in all subjects of tribal and non-tribal students of class IX.
3. To identify factors influencing students' achievement levels of mathematics, including socio-economic background, parental education and occupation, geographical location, attendance rate, and problems faced by the students, distance to school, well-constructed road from home to school.
4. To analyse the classroom Teaching - Learning Processes.

5.3.5 HYPOTHESIS

1. There is a significant difference in the achievement in mathematics between tribal and non-tribal students of class IX.

5.3.6 POPULATION

The target population for the study consisted of Class IX tribal students of secondary schools in Koraput district, Odisha. The sample included both these students and their teachers.

5.3.7 SAMPLE SIZE

Keeping in view the objectives as well as design of the study, approximately 100 students and 20 Teacher will be surveyed to obtain a reliable dataset.

5.3.8 TOOLS

The following tools will be used for the study:

i. Questionnaire for Student

ii. Classroom Observation Schedule

5.3.9 PROCEDURAL OF DATA COLLECTION

To collect the data, the researcher took written permission from the District Education Officer, Heads and Principals of the selected schools. Before using the tools, the purpose of the study was explained to them in advance in a clear and simple manner. This helped the teachers and students to participate honestly and without any hesitation. The written permission was properly signed by the concerned authorities.

The investigator requested the Principals/Head of the sample schools to grant permission to conduct the work. Before the collection of data in each sample school, one day spent in rapport establishment with the students. The objectives of the tests were explained to the students. They were taken into confidence that these tests will not affect in any way their annual results and the answers given by them will be kept

confidential. The help of the concerned teacher was solicited to enlist the responses from the respondents and for proper administration of the test.

5.3.10 STATISTICAL TECHNIQUES

Following Statistical Techniques were used in the present study for analysing the data:

Mean, percentile, SD,

5.4.0 EDUCATIONAL IMPLICATIONS

The present study is related to Socio-Economic Status and other factor influence academic achievement of Tribal and non-Tribal students at secondary level. This study mainly focused the SES and other factor of the students which create problems that related to education of the Tribal students of the district, face in course of their completion of secondary education ie. H.S.L.C Examination. The secondary education is the crucial means to make a student efficient for the future and empowered society, which can only be achieved through successive completion of H.S.L.C Examination, irrespective of caste, community, sex, religion, locality (Urban/Rural) and socio-economic background.

The **Tribal communities in Koraput** remain educationally disadvantaged and are notably lagging in comparison to other sections of society. Recognizing the unique needs and historical marginalization of Scheduled Tribes (STs), the **Constitution of India** has incorporated several **special safeguards and provisions** to protect these communities from exploitation and to ensure social justice.

However, the study has some implications for the persons/ agencies who are involved in the process of development of education, Thus, this study has implication for Students, Teacher, Curriculum Developers, Policy Makers, School Administrators and Parents. The implications for each of these are dealt in the captions 5.4.1 to 5.4.5.

5.4.1 IMPLICATIONS FOR STUDENTS

The findings of the study show that tribal students in Class IX generally score lower in mathematics compared to their non-tribal counterparts. This implies that students especially from tribal backgrounds need to be motivated through more inclusive and culturally relevant teaching strategies. Students must be encouraged to view mathematics not merely as a subject but as a practical and useful skill. Remedial support, peer learning, and confidence-building activities should be promoted. Early identification of learning gaps and timely academic intervention will help bridge the achievement divide. Moreover, students need to be made aware of the long-term benefits of Achievement in Mathematics in higher studies and careers.

5.4.2 IMPLICATIONS FOR TEACHERS

Teachers play a critical role in reducing achievement gaps. The study reveals that tribal students underperform not necessarily due to lack of ability but due to socio-cultural and infrastructural barriers. Hence, teachers should adopt context-sensitive and

inclusive pedagogies. Using multilingual instruction or incorporating local examples can make concepts more relatable. Teachers should also receive training in handling multi-level classrooms and adopting activity-based and experiential learning methods. Regular diagnostic assessments can help teachers personalize support. Building strong teacher-student rapport, especially with tribal learners, will further enhance motivation and engagement.

5.4.3 IMPLICATIONS FOR PARENTS

Parental involvement is crucial in enhancing students' academic outcomes. The study shows that low parental education and lack of academic support at home contribute to lower achievement levels among tribal students. Awareness programs for parents should be initiated to help them understand the value of mathematics education and how they can support their children even if they are not formally educated. Parents should be encouraged to create an encouraging learning environment at home, ensure regular school attendance, and support their children's learning activities. Strengthening school-community partnerships will empower parents to actively participate in their children's education.

5.4.4 IMPLICATIONS FOR TEACHER TRAINING PROGRAMMES

Pre-service and in-service teachers training programmes may include the creation of lesson plans using a constructivist approach. Approach used in this study will help student-teacher to understand pedagogical content knowledge in mathematics. They will become competent in developing instructional material, for mathematics and other subjects.

5.4.5 IMPLICATIONS FOR TEACHER EDUCATORS

The teacher educators should motivate pupil teachers to implement this innovative approach of Mathematics Teaching. They should set up workshops for pupil teachers to train them on how to implement the Constructivist Approach effectively in Mathematics Teaching Learning.

5.4.6 IMPLICATIONS FOR CURRICULUM DEVELOPERS

Curriculum designers need to recognize the socio-cultural backgrounds of tribal students. A one-size-fits-all approach often alienates learners from indigenous or rural settings. The curriculum should include local knowledge systems, culturally relevant contexts, and examples from tribal life to make learning meaningful. Concepts should be introduced gradually, ensuring clarity and coherence with the student's lived experiences. Curriculum frameworks like NCF 2023 and NEP 2020 should be effectively localized to meet the learning needs of marginalized students. Content must foster mathematical thinking while also being accessible and engaging for tribal learners.

5.4.7 IMPLICATIONS FOR ADMINISTRATORS

School administrators must address infrastructural and pedagogical gaps highlighted in the study. Many tribal students face challenges like distance to school, poorly constructed roads, and lack of basic learning materials. Administrators should ensure the availability of qualified teachers, especially in mathematics, and promote the use of TLMs (Teaching-Learning Materials). Special coaching programs and bridge courses can be organized to support tribal students. Creating safe, inclusive, and engaging learning environments will reduce dropout rates and improve academic achievement. Monitoring systems should be in place to track student progress and ensure equity in educational access and outcomes.

5.5.0 SUGGESTIONS FOR FURTHER STUDIES

1. The Academic Achievement in other subject areas can be studied.
2. The Academic Achievement in other subject areas with different samples can be studied.
3. The Academic Achievement in Primary, Higher Secondary and college level can be studied.
4. Comparative study of Academic Achievement in Mathematics of students in different background can be undertaken.
5. Experiments may be carried out to assess the impact of different Models on Achievement.
6. Academic Achievement and ICT can be integrated, and the synergistic effect can be studied at many levels and disciplines.
7. Effectiveness of Academic Achievement based Instructional Material on

   Achievement of children with special needs, can be studied.
8. The Academic Achievement in different background can be studied.
9. Comparative studies on achievement in other core subjects (Science, English, Social Studies) of tribal vs. non-tribal students.
10. Investigate the effect of mother tongue instruction on conceptual understanding in mathematics
11. Experiments may be carried out to assess the impact of the psychological barriers (math anxiety, self-concept) affecting tribal students' performance.
12. A gender-based study on mathematics achievement among tribal students.
13. Comparative studies on achievement in how community involvement in school governance influences educational performance.

14. Comparative studies on tribal achievement across multiple districts to understand regional disparities.

15. Can be study the role of digital learning tools and technology in improving tribal education outcomes.

5.6.0 CONCLUSION

The present study titled "A Study of Achievement in Mathematics of Class IX Students Belonging to Schedule Tribe of Koraput District, Odisha" was undertaken to explore the levels of academic achievement in mathematics among tribal students and identify the factors influencing it. The findings reveal a consistent gap between the mathematics performance of tribal and non-tribal students. This disparity is reflective not of the students' capabilities but of systemic barriers such as socio-economic disadvantage, low parental education, lack of academic support at home, and geographic isolation.

Tribal students scored on average in the second division, while non-tribal students often reached first division levels. The study further highlights how variables like parental education, occupation, income level, school attendance, access to roads, and school distance significantly affect mathematics achievement. It is evident that these factors intersect and compound one another, creating a learning environment that is unequal and challenging for tribal students. The educational ecosystem in tribal-dominated regions like Koraput needs urgent reform. Students from marginalized communities are burdened by external circumstances that limit their academic success. Schools often lack adequate infrastructure, and teachers are not always equipped to address the unique learning needs of tribal students. Language barriers further complicate understanding, as many tribal students speak local dialects that differ from the medium of instruction. All these contribute to reduced confidence, engagement, and academic performance.

Teachers must become agents of change by creating inclusive classrooms and using localized teaching strategies. The importance of mother-tongue-based multilingual education and experiential learning cannot be overstated in this context. Furthermore, the curriculum should incorporate tribal culture and heritage to ensure relevance and foster identity and belonging. Parents, though often limited by their literacy levels, must be empowered through community outreach programs to support their children's education. Their role in motivating and sustaining regular attendance is crucial. The administration must ensure equitable resource allocation, provide qualified mathematics teachers in remote schools, and establish effective monitoring mechanisms. Special programs like remedial classes, summer camps, and mentorship programs can boost learning outcomes. Transportation facilities, roads, and distance to school also play critical roles in academic participation and must be addressed at the policy level. The study underscores the urgent need for equity-focused, inclusive educational strategies. NEP 2020 and NCF 2023 offer a promising policy foundation, but their success depends on effective local implementation. By focusing on both

access and quality of education, especially in mathematics, we can pave the way for the socio-economic upliftment of tribal communities.

This research contributes to a better understanding of the root causes of academic underachievement among tribal students and emphasizes the need for a collaborative effort among stakeholders—students, teachers, parents, administrators, and policymakers—to bridge the educational gap. Only then can education serve its purpose as a tool of empowerment, equity, and national development.

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APPENDICES

APPENDICES

APPENDIX-I

A STUDY OF ACHIEVEMENT LEVEL IN MATHEMATICS OF CLASS IX TRIBAL STUDENTS OF KORAPUT DISTRICT, ODISHA

Name of the School: ______________________ **Region where the school located:** Urban/ Semi Urban/Rural/Remote

Class: __________ **Subject:** ____________________ **No of Class Per Week:** ____________________

Date: __________

Student ID	Gender	Category (Tribal Status)	Age	Overall % of Marks (8th)	% of Marks in Mathematics (8th)	Overall % of Marks (9th) (if any)	% of Marks in Mathematics (9th)	Parental Education (Father)	Parental Education (Mother)	Economic Status (Monthly Income)	Main Occupation of Household	Geographical Location	Is there a well-constructed road to the school?	Problems Faced to Reach School	Distance to School (km)	Attendance Rate (%)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

Economic Status (Monthly Income):
1: Below ₹5,000
2: ₹5,001 – ₹10,000
3: ₹10,001 – ₹20,000
4: ₹20,001 – ₹50,000
5: Above ₹50,000

Main Occupation of Household:
1: Agriculture
2: Daily Wage Labor
3: Government Job
4: Private Sector Job
5: Business
6: Other (Specify

Geographical Location:

1. Hilly Terrain
2. Plateau Region
3. Valley Areas
4. Plains
5. Remote/Isolated Villages
6. Seasonal Impact Zones

Problems Faced to Reach School: (Multiple responses can be allowed if required.)
1: Long Distance
2: Poor Roads or No Roads
3: Lack of Transportation
4: Seasonal Obstacles (e.g., floods, landslides)
5: Safety Concerns (e.g., wild animals, crime)
6: Other (Specify)

Is there a well-constructed road to the school? 1: Yes 2: No

APPENDIX-II

Observation Schedule for Classroom Observation

Date: _____ **Duration:** _____

Name of the Teacher: _____ **Class:** _____

Subject: _____

Research Study on "Achievement Levels in Mathematics of Class IX Tribal Students in Koraput District"

Section 1: Teaching Methods & Classroom Environment

Aspect Observed	Observation Notes	Rating (1-5)
Student participation in class (e.g., asking questions, answering, contributing)		□1 □2 □3 □4 □5
Teacher's teaching method(s) (e.g., lecture, group work, problem-solving, practical applications)		□1 □2 □3 □4 □5
Use of multimedia or teaching aids (charts, videos, etc.)		□1 □2 □3 □4 □5
Teacher-student interaction (e.g., direct questioning, feedback)		□1 □2 □3 □4 □5
Classroom organization (e.g., seating arrangement, student grouping)		□1 □2 □3 □4 □5
Teaching resources availability (e.g., books, notes, tools)		□1 □2 □3 □4 □5

Rating scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent

Section 2: Student Engagement and Behaviour

Aspect Observed	Observation Notes	Rating (1-5)
Student attention and focus during the lesson (e.g., actively listening, taking notes)	_	□1 □2 □3 □4 □5
Student interaction with peers (e.g., group work, discussions)	_	□1 □2 □3 □4 □5
Behaviour of students in the class (e.g., any disruptive behaviour, distractions)	_	□1 □2 □3 □4 □5
Student engagement with learning materials (e.g., textbooks, worksheets, practical activities)	_	□1 □2 □3 □4 □5
Signs of motivation and interest in mathematics (e.g., raising hands, volunteering to answer)	_	□1 □2 □3 □4 □5

Rating scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent

Section 3: Teaching Strategies and Adaptation to Student Needs

Aspect Observed	Observation Notes	Rating (1-5)
Teacher's effort to address students' diverse needs (e.g., slower learners, language difficulties)		□1 □2 □3 □4 □5
Use of real-world examples or applications in mathematics		□1 □2 □3 □4 □5
Clarification of difficult concepts or doubts (e.g., teacher explaining in simpler terms)		□1 □2 □3 □4 □5
Support for struggling students (e.g., individual attention, extra practice)		□1 □2 □3 □4 □5

Rating scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent

Section 4: Student Performance and Achievement Indicators

Aspect Observed	Observation Notes	Rating (1-5)
Student response to questions or problems posed by teacher		□1 □2 □3 □4 □5
Level of understanding demonstrated by students (e.g., through their answers, participation)		□1 □2 □3 □4 □5
Completion of assignments or tasks given during class		□1 □2 □3 □4 □5
Overall classroom achievement level (based on observations of student performance)		□1 □2 □3 □4 □5

Rating scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent

Section 5: Challenges in Teaching Mathematics to Tribal Students

Aspect Observed	Observation Notes	Rating (1-5)
Language barriers affecting understanding		□1 □2 □3 □4 □5
Cultural factors influencing student engagement		□1 □2 □3 □4 □5
Limited access to resources (books, materials)		□1 □2 □3 □4 □5
Parental involvement or community support		□1 □2 □3 □4 □5
Overall impact of challenges on student performance		□1 □2 □3 □4 □5

Rating scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, 5 = Excellent

Section 6: Additional Observations/Comments

- **What are the strengths observed in the teaching and learning process?**

- **What are the areas that need improvement?**

- **Any other noteworthy observations or comments?**