



# Understanding Student Attitudes towards Mathematics: A Study of 10th Grade Students in Arunachal Pradesh

**Dr. Tage Monju\*, and Sri. Sanjeeb. Barman\*\***

\*Assistant Professor, Department of Education,

Rajiv Gandhi University, Rono Hills, Doimukh- 791112, Arunachal Pradesh. \*\*Assistant Professor,

Vivekananda Kendra College of Teacher Education, Arunachal Pradesh

## *Abstract*

Mathematics education is pivotal for cognitive development and academic progress, particularly in the fields of science, technology, engineering, and mathematics (STEM). This study investigates the attitudes of 10th-grade students in Arunachal Pradesh, India, towards mathematics, focusing on gender and ethnicity as key variables. The study has two primary objectives. First, it seeks to understand the attitudes of male and female 10th-grade students in Arunachal Pradesh towards mathematics. Second, it aims to explore the attitudes of Arunachal Pradesh Scheduled Tribe (APST) and Non- Arunachal Pradesh Scheduled Tribe (Non-APST) 10th-grade students towards mathematics. Employing a descriptive cum survey method, the research sample consists of 100 10<sup>th</sup> government school students from Papum Pare District, Arunachal Pradesh. Data are collected using the Attitude towards Mathematics (ATM) Scale. The study uncovers significant gender-based differences in students' attitudes towards mathematics. Male students exhibit a notably more favourable attitude compared to their female counterparts. However, no significant differences were detected based on ethnicity (APST and Non-APST).

Key Words: Arunachal Pradesh, PapumPare, Attitude, Mathematics, APST, 10<sup>th</sup> grade students.

## **1.0 Introduction:**

Mathematics education plays a pivotal role in the cognitive development and academic growth of students. It not only equips them with problem-solving skills but also lays the foundation for various career paths in science, technology, engineering, and mathematics (STEM) fields. However, the effectiveness of mathematics education is significantly influenced by students' attitudes towards the subject. Attitudes can impact engagement, motivation, and ultimately, learning outcomes.

Arunachal Pradesh, situated in the north-eastern part of India, is a region characterized by its rich cultural diversity, geographical challenges, and a unique socio-economic landscape. As such, it presents an intriguing context to explore how 10th-grade students in this region perceive mathematics. This research aims to delve into the attitudes of 10th-grade students in Arunachal Pradesh towards mathematics, with a specific focus on gender and ethnicity.

## 1.2 Review of Related Literature:

1. **Choudhary and Das (2012)** studied 500 ninth-grade students in Assam and found that attitudes toward mathematics and study habits significantly influence academic performance. Attitude contributed 15.2%, and study habits contributed 29% to math achievement. Surprisingly, factors like medium of instruction and gender did not affect math performance.
2. **Bora and Ahmed (2018)** surveyed 400 secondary school students in Assam to understand their attitudes toward learning geometry. They discovered notable differences in attitude between male and female students and between government and private school students.
3. **Kapoor and Lhungdim (2014)** focused on tribal students in the northeastern region, including Arunachal Pradesh, revealing that language barriers and limited access to resources posed unique challenges in learning mathematics. Culturally sensitive teaching methods were recommended.
4. **Saroh (2015)** explored the link between teaching styles and students' math attitudes in schools, emphasizing the need for teacher training programs and innovative teaching methods to foster positive attitudes.
5. **Singh and Lhungdim (2019)** conducted research in Arunachal Pradesh and identified issues such as a shortage of qualified math teachers and limited resources affecting students' math attitudes. They suggested interventions like teacher development and resource provision.

These studies stress the importance of students' attitudes, study habits, and regional challenges. Positive attitudes and effective study habits significantly impact academic performance. Unique regional challenges, like language barriers and limited resources, affect attitudes, especially among tribal students. To improve mathematics education and attitudes, culturally sensitive teaching and better teacher training and resources are recommended.

## 1.3 : Significance of the Study :

This study's rationale is rooted in the crucial role mathematics plays in various careers, especially in STEM fields, and the impact of students' attitudes toward math on their career aspirations. In Arunachal Pradesh, where a skilled workforce is vital for development, understanding these attitudes is of paramount importance. Additionally, this research aligns with broader educational goals by informing policies and curriculum development. Tailoring math education to Arunachal Pradesh's students' needs can enhance teaching and learning. The study also aims to uncover gender-based disparities in math attitudes, promoting inclusive

education and gender equity. Moreover, it highlights cultural sensitivity in education by examining attitudes among diverse ethnic groups. This respect for diverse perspectives enriches the educational experience. The findings can improve teacher training, creating more engaging math learning environments, potentially leading to better student outcomes. Furthermore, this study contributes to educational research, particularly in challenging settings like Arunachal Pradesh, laying the foundation for future studies. As Arunachal Pradesh develops, an educated math-proficient workforce is essential, making this research vital for the region's educational growth. More over in the past very few scholars like Kapoor and Sinha (2010), Kapoor and Lhungdim (2014), Saroh (2015) , Singh and Lhungdim (2019) tried to understand the attitude of the students towards mathematics and the status of mathematics education in Arunachal Pradesh through their research work therefore , the scarcity of previous research in this area motivated the present researchers to delve more into this vital aspect of education in Arunachal Pradesh.

**1.4 : Statement of the Problem:** *‘Understanding Student Attitudes towards Mathematics: A Study of 10th Grade Students in Arunachal Pradesh’*

**1.5: Operational Terms:**

1. **Attitude:** In the context of this study, "attitude" refers to the tendency of 10th-grade students in Arunachal Pradesh to react favourably and unfavourably toward the subject of mathematics.
2. **APST (Arunachal Pradesh Schedule Tribe):** APST stands for Arunachal Pradesh Schedule Tribe. It refers to the indigenous tribal communities or groups recognized and listed as Scheduled Tribes within the state of Arunachal Pradesh, India.
3. **Non-APST (Non-Arunachal Pradesh Schedule Tribe):** Non-APST signifies individuals who do not belong to the Scheduled Tribe category as recognized in Arunachal Pradesh. These individuals are from other ethnic or social backgrounds within the state
4. **Papum Pare District:** In the context of this study, "Papum Pare District" refers to a specific administrative region within the state of Arunachal Pradesh, India, characterized by its unique geographical, cultural, and socio-economic features. The district serves as the geographical area of focus for the research, comprising government schools and 10th-grade students included in the study sample.

**1.6: Objectives:**

1. To study the attitude of Male and Female 10<sup>th</sup> grade students of Arunachal Pradesh towards Mathematics
2. To study the attitude of APST and Non –APST 10<sup>th</sup> grade students of Arunachal Pradesh towards Mathematics

### 1.7: Hypotheses:

1. There is no significant difference between the attitude mean score of Male and Female 10th grade students of Arunachal Pradesh towards Mathematics
2. There is no significant difference between the attitude mean score of APST and Non –APST 10th grade students of Arunachal Pradesh towards Mathematics.

### 1.8: Delimitation: The study was delimited to:

1. The state of Arunachal Pradesh
2. Papum pare district
3. 100 10<sup>th</sup> grade students
4. Government schools

### 1.9 : Methodology:

**1. Research design:** Descriptive cum survey method

**2. Population:** 10<sup>th</sup> grade APST and Non – APST students studying in the Government schools of Papum Pare District of Arunachal Pradesh.

**3. Sample and Sampling Technique:** A sample of 100 govt school students was selected for the study using quota –random sampling technique.

**4. Tool:** The Attitude towards Mathematics (ATM) Scale, originally developed by Dr. S. C. Gakhar and Rajani, was utilized. The scale's reliability coefficient, determined by Rai (2013) using the split-half method, was 0.78. Furthermore, the validity of the tool was established with the assistance of subject matter experts.

**5. Statistical technique :** Mean , SD and t –test

**6. Administration of the tool:** Field visits were conducted in August 2023 to administer the scale, and data analysis included mean, standard deviation, and t-tests to identify key findings.

### 1.10: Data Analysis and Interpretation:

**Objective 1 :** To study the attitude of Male and Female 10th grade students of Arunachal Pradesh towards Mathematics

**Hypothesis 1:** There is no significant difference between the attitude mean score of Male and Female 10<sup>th</sup> grade students of Arunachal Pradesh towards Mathematics



**Table1.1 showing the Mean , SD and t-value of attitude of the 10<sup>th</sup> grade students of capital complex area of papum pare district Arunachal Pradesh in relation to the variable ‘Gender’**

Group	N	M	SD	df	t Value	Table t value	Remarks
Male	51	180.8235	46.99775	98	4.104	1.98	significant at 0.05 level of interval
Female	49	138.9184	54.94650				

Source : field visit , August 2023

**Interpretation:** The above table shows that the calculated t value of 4.104 is greater than the Table t value of 1.98 for 98 df at 0.05 level of significance . Hence there is a significant difference between the attitude of male and female 10<sup>th</sup> grade students of Arunachal Pradesh towards Mathematics subject . therefore , the formulated null hypothesis i.e, “There is no significant difference between the attitude mean score of Male and Female 8th grade students of Arunachal Pradesh towards Mathematics” gets disapproved . The table also shows that the mean score of 10<sup>th</sup> grade male student (180.82) is higher than the mean score of female students (138.91) which shows that Male 10<sup>th</sup> grade students have more favourable attitude towards mathematics subject than the female 10<sup>th</sup> grade students.

**Objective 2:** To study the attitude of APST and Non –APST 10th grade students of Arunachal Pradesh towards Mathematics

**Hypothesis 2 :** There is no significant difference between the attitude mean score of APST and Non –APST 10<sup>th</sup> grade students of Arunachal Pradesh towards Mathematics.

**Table 1.2 showing the Mean , SD and t-value of attitude of the 10<sup>th</sup> grade students of capital complex area of papum pare district Arunachal Pradesh in relation to the variable ‘ ethnicity’**

Group	N	M	SD	df	t-value	Table t value	Remarks
APST	75	135.9200	57.19733	98	-2.65	1.98	Not significant at 0.05 level of interval
NON-APST	25	169.0800	43.54492				

Source : field visit , August 2023 . \* APST : Arunachal Pradesh Scheduled Tribe . \*\*Non APST : Non - Arunachal Pradesh Scheduled Tribe

**Interpretation:** The above table shows that the calculated t value of -2.65 is lesser than the Table t value of 1.98 for 98 df at 0.05 level of significance . Hence there is no significant difference between the attitude of APST and Non APST 10<sup>th</sup> grade students of Arunachal Pradesh towards Mathematics subject . therefore , the formulated null hypothesis i.e, “There is no significant difference between the attitude mean score of Male and Female 8th grade students of Arunachal Pradesh towards Mathematics” gets approved . The table also shows that the mean score of Non APST student (169) is higher than the mean score of APST (135.9) students which shows that Non-APST 10<sup>th</sup> grade students have more favourable attitude towards mathematics subject than the APST 10<sup>th</sup> grade students in Arunachal Pradesh.

## 2.0: Findings of the study:

1. There is a significant difference in the attitude of Male and Female 10<sup>th</sup> grade students of Papum pare district Arunachal Pradesh towards Mathematics subject .
2. There is no significant difference in the attitude of APST and NON –APST 10<sup>th</sup> grade students Papum pare district Arunachal Pradesh towards Mathematics subject .

## 2.1 Suggestions:

1. Since there is a significant difference in the attitudes of male and female 10th-grade students towards mathematics, educators and policymakers may consider tailoring mathematics education approaches to address these gender-based differences. Strategies may be designed to engage female students more effectively in mathematics, making the subject more appealing and relevant to their interests and career aspirations.
2. Teachers of Arunachal Pradesh should encourage students, particularly females; to pursue STEM fields should be a priority to bridge the gender gap in these areas.
3. Regular assessments of students' attitudes can also provide valuable feedback for educational policymakers.
4. Further research in the field of mathematics education, particularly in challenging settings like Arunachal Pradesh, to better understand and address the unique challenges and opportunities should be taken up by the researchers in the future .
5. Govt of Arunachal Pradesh may allocate more resources to improve the overall quality of mathematics education in the region, including the recruitment and training of qualified mathematics teachers, the provision of updated materials, and the establishment of mathematics-focused extracurricular activities.

## Conclusion:

In the present study, significant gender-based differences were observed in the attitudes of 10th-grade students in Arunachal Pradesh toward mathematics, with male students demonstrating a more positive attitude

compared to their female counterparts. However, no significant differences were found in attitudes based on ethnicity (APST and Non-APST). These findings highlight the importance of tailored strategies to engage female students effectively in mathematics education, thereby addressing the gender gap in STEM fields. Moreover, fostering inclusive mathematics education that respects diverse cultural backgrounds is crucial. Regular attitude assessments can provide valuable insights for shaping educational policies. Future research should delve further into the unique challenges and opportunities in mathematics education in Arunachal Pradesh.

### Reference:

Bora, A., & Ahmed, S. (2018). Secondary school students' attitude towards their learning geometry: A survey of Diphu town secondary schools. *IJRAR*, 5(3).

Choudhury, R., & Das, D. K. (2012). Influence of Attitude Towards Mathematics and Study Habit on the Achievement in Mathematics at the secondary stage. *International Journal of Engineering Research and Applications (IJERA)*, 2(6), 192-196.

Koul, L. (2012). *Methodology of Educational Research, Fourth Edition*. Vikash Publishing House Pvt. Ltd.

Mangal, S. K. (2010). *Advanced Educational Psychology*. Prentice Hall of India Private Ltd.

Rai, D. (2013). Attitude towards mathematics and study habits in relation to the achievement in mathematics of class x students in east and south Sikkim (Doctoral dissertation). North-Eastern Hill University.

Saroh, T. (2015). A Study on Academic Achievement of Elementary School Students in East Siang District of Arunachal Pradesh. *International Journal of Humanities & Social Science Studies (IJHSSS)*, 2(3), 118-124.

Singh, R. D., & Lhungdim, P. T. (2019). Status of the Performance of Learners in Mathematics at Elementary School Stage in Arunachal Pradesh: A Critical Study. *International Journal for Research in Applied Science & Engineering Technology (IJRASET)*, 7(6).

*Methodology of Educational Research (IGNOU)*.