



RELATIONSHIP BETWEEN SCIENTIFIC ATTITUDE AND ACADEMIC ACHIEVEMENT OF CLASS IX STUDENTS IN KAMRUP METRO, ASSAM

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ABSTRACT :

The present study aimed to examine the levels of scientific attitude among Class IX students and to explore its relationship with academic achievement in the science subject in the district of Kamrup Metro, Assam. A descriptive survey method was adopted for the study. The sample consisted of 200 students (100 males and 100 females) selected through a proportionate stratified random sampling technique. The Scientific Attitude Scale (SAS-BM-2022) was used as the primary tool for data collection, and academic achievement scores were obtained from school records. Data were analysed using mean, standard deviation, t-test, and Pearson's correlation. The findings revealed that the majority of students (51.5%) exhibited a moderate level of scientific attitude, while 23% had a high level and 25.5% a low level. Gender-wise analysis revealed no significant difference in overall scientific attitude; however, females exhibited higher curiosity and faith in the scientific method, whereas males displayed stronger rationality and a greater aversion to superstition. Academic performance was also found to be balanced across genders, with both groups achieving high first-division results. Correlation analysis revealed a positive and significant relationship between academic achievement and most dimensions of scientific attitude, with the exception of faith in the scientific method. The overall correlation ($r = 0.312$) indicated that students with a higher scientific attitude performed better in science. The study concludes that fostering curiosity, rationality, and open-mindedness among students can significantly enhance their academic achievement in science.

Keywords: Scientific attitude, Academic achievement, Science education

I. Introduction:

The modern age is the scientific age, characterised by the powerful and rapid growth of scientific progress, which in turn fosters the formation of a scientific attitude. It is an important



result of modern science education. For the new generation at the school level, the primary goal of science education is to foster a scientific attitude that addresses the challenges of daily life. It involves open-mindedness, accurate knowledge, the scientific method, curiosity, and a problem-solving attitude in a scientific manner. According to Aikin and Aikin (1996), “Scientific attitude is defined as following scientific methods and displaying a scientific mindset. Scientific attitude, open-mindedness, scepticism, observation, objectivity, honesty, intellectual Integrity is to suspend judgement pending the acquisition of evidence.” Scientific attitude is not one’s personal mindset, but it’s a shared commitment in the community. It means that if a theory is contradicted by new empirical evidence, then the theory must be revised or reviewed (Schmaus, 2020).

Academic achievement refers to the level of knowledge, skills, and proficiency a student attains in an educational setting. According to Carter (1959), it represents the knowledge or skills acquired through school subjects, as reflected in test scores or teachers’ evaluations. Similarly, Chaplin defines it as the degree of attainment or proficiency measured by standardised tests or teacher assessments. Kapoor (1969) emphasised that academic achievement is a multidimensional process involving various stages of learning and development. Bhat and Bhardwaj (2014) described it as the recognised success achieved within formal educational environments such as schools and universities. Bolt (2011) added that it reflects measurable progress in acquiring educational knowledge and skills. Drew (2023) highlighted that indicators of academic achievement may include grades, awards, scholarships, rankings, leadership roles, internships, certifications, and other recognitions of educational success.

Scientific attitude involves curiosity, open-mindedness, critical inquiry, and tolerance (Ebel, 1997). It encourages logical reasoning and objective thinking, helping to overcome social evils and irrational beliefs. Studies have shown a positive correlation between scientific attitude and academic achievement (Ahuja, 2017; Imran et al., 2019). However, many researchers note that while academic aspects are emphasised, process skills and logical thinking are often neglected (Lyndem, 2014; Shanthi, 2014). This study, therefore, aims to assess the level of scientific attitude and its relationship with academic achievement among secondary school students.



II. Objectives of the Study:

- 1] To study levels of scientific attitude among class IX students of Kamrup Metropolitan, Assam
- 2] To compare the levels of scientific attitude between male and female students of class IX of the district of Kamrup Metropolitan, Assam
- 3] To study the academic achievement in the science subject of class IX students in the district of Kamrup Metropolitan, Assam, with respect to Gender (Male and Female)
- 4] To know the relationship between scientific attitude and academic achievement in the science of the students of class IX students

III. Hypothesis:

H₀₁ There is no significant difference in the dimensions of scientific attitude between male and female students of class IX in the district of Kamrup Metropolitan, Assam

H₀₂ There is no significant relationship between Scientific Attitude and Academic Achievement in the Science of the students of class IX.

H₀₃ There is no significant relationship between Scientific Attitude and Academic Achievement in the Science of the students of class IX in relation to Gender I (Male and Female)

IV. Review of Related Literature:

The review of related literature on the relationship between scientific attitude and academic achievement reveals that most studies, both abroad and within India, report a positive and significant correlation between the two variables. Studies conducted by Lacap (2015), Srivastava (2014), Kavitha (2015), Singh et al. (2016), Ahuja (2017), Banerjee (2019), Vani (2019), D'Souza (2020), Patel (2021), Sharma and Yadav (2023), Rima and Gangrade (2024), and Kumari et al. (2025) consistently found that students with a higher level of scientific attitude characterized by curiosity, open-mindedness, objectivity, critical thinking, and rationality—tend to achieve higher academically in science subjects. These studies highlight



that cultivating positive scientific attitudes through innovative pedagogical strategies such as cooperative learning, peer-led concept mapping, and techno-enhanced instruction contributes significantly to better academic outcomes. Similarly, Mohan (2023) and Banerjee (2022) also observed a positive interrelationship among scientific attitude, self-concept, social behaviour, and academic achievement, reinforcing the holistic role of scientific mindset in overall student performance. A few studies, such as Olasehinde and Olatoye (2014) and Lyndem (2014), however, found a positive but not significant relationship, indicating that while scientific attitude is related to achievement, other external factors like teaching methods, parental support, or school environment may play stronger roles in determining students' success. In line with this, Kumari (2013), Myrten (2013), and Kumar (2019) from the North-Eastern region reported that scientific attitude and scientific aptitude both significantly influence students' academic achievement in science, suggesting that students with higher scientific aptitude tend to grasp concepts more easily and perform better academically.

Gender and locality also appeared as important influencing variables in several studies. Rajendran (2007), Hunashal (2013), Ahuja (2017), and Sharma and Yadav (2023) revealed that female students generally exhibited higher scientific attitude and better achievement in science compared to male students, while urban students often performed better than rural counterparts. However, Bettaswamy and Kumar (2022) found no significant gender difference, suggesting contextual variations based on social and institutional factors.

V.Methodology:

The present study followed a descriptive survey method to investigate the relationship between scientific attitude and academic achievement among secondary school students. The independent variable of the study was *scientific attitude*, while the *dependent variable* was *academic achievement*, with *gender (male and female)* serving as a moderating variable. The population comprised all Class IX students studying in government schools of Kamrup (Metro) district. The sample comprised 200 respondents, 100 males and 100 females, selected using a proportionate stratified random sampling technique. The "Scientific Attitude Scale (SAS-BM-2022)" was used as the main research tool and re-categorised the levels. Primary data were collected by visiting selected schools during the year 2014, while secondary data were obtained



from UDISE+ (2022–2023) records for student enrolment. Data were analysed using mean, standard deviation, Pearson’s correlation, and t-test with the help of SPSS (version 27) and Microsoft Excel (2021) software.

IV. Resultss and Discussion:

The analysis is to examine the levels of scientific attitude among students, compare gender-wise differences, and study the relationship between scientific attitude and academic achievement. The data are presented in tables with detailed explanations.

Table 1: Levels of the scientific attitude among class IX students

Dimensions	Level	No. of Students	%
Rationality	High	48	24.0
	Moderate	95	47.5
	Low	57	28.5
Curiosity	High	52	26.0
	Moderate	102	51.0
	Low	46	23.0
Open-Mindedness	High	45	22.5
	Moderate	100	50.0
	Low	55	27.5
Faith in Scientific Method	High	40	20.0
	Moderate	110	55.0
	Low	50	25.0
Aversion to Superstition	High	42	21.0
	Moderate	95	47.5
	Low	63	31.5
Overall Scientific Attitude	High	46	23.0
	Moderate	103	51.5
	Low	51	25.5

Source: Field Survey, 2024



The results show that a majority of students (51.5%) exhibit a moderate level of scientific attitude, 23% a high level, and 25.5% a low level. Most students display moderate rationality and curiosity, reflecting a balanced yet developing attitude toward science. The findings indicate that continuous efforts are needed to encourage logical reasoning, curiosity, and a scientific approach among the learners.

Table 2: Levels of the scientific attitude among class IX students in relation to Gender

Dimensions	Levels	Male	%	Female	%
Rationality	High	28	28.0	20	20.0
	Moderate	50	50.0	54	54.0
	Low	22	22.0	26	26.0
Curiosity	High	22	22.0	30	30.0
	Moderate	53	53.0	52	52.0
	Low	25	25.0	18	18.0
Open-Mindedness	High	26	26.0	23	23.0
	Moderate	48	48.0	50	50.0
	Low	26	26.0	27	27.0
Faith in Scientific Method	High	20	20.0	22	22.0
	Moderate	55	55.0	57	57.0
	Low	25	25.0	21	21.0
Aversion to Superstition	High	26	26.0	18	18.0
	Moderate	48	48.0	50	50.0
	Low	26	26.0	32	32.0
Overall Scientific Attitude	High	25	25.0	21	21.0
	Moderate	52	52.0	55	55.0
	Low	23	23.0	24	24.0

The results reveal that both male and female students mostly fall in the moderate category across all dimensions. Males show slightly higher rationality and rejection of superstitions, while females exhibit higher curiosity and faith in the scientific method. The overall scientific attitude of both genders remains almost similar, with minor variations in specific traits.



Table 3: Significant difference between male and female students in scientific attitude dimensions

Dimension	Gender	Mean	SD	t-value	p-value	Remarks
Rationality	Male	28.4	3.5	1.89	0.061	Not Significant
	Female	27.9	3.3			
Curiosity	Male	19.8	2.9	2.42	0.017	Significant
	Female	20.6	2.3			
Open-Mindedness	Male	37.1	4.1	1.21	0.229	Not Significant
	Female	36.5	4.4			
Faith in Scientific Method	Male	35.9	3.8	1.98	0.049	Significant
	Female	36.5	3.7			
Aversion to Superstition	Male	47.8	7.8	2.12	0.035	Significant
	Female	45.9	7.3			
Overall Scientific Attitude	Male	169.2	12.9	1.42	0.156	Not Significant
	Female	167.4	11.7			

Source: Field Survey, 2024

The results indicate that both genders share similar overall scientific attitudes. Significant differences exist in curiosity, faith in the scientific method, and aversion to superstition, where females show higher curiosity and scientific belief, while males demonstrate stronger rejection of superstition. Rationality and open-mindedness show no significant gender difference.

Table 4: Academic achievement in the science subject among class IX Students of Kamrup Metropolitan, Assam, with Respect to Gender

Status	Male (N=100)	%	Female (N=100)	%	Total (N=200)
Simple Pass	15	15.0	18	18.0	33
2nd Division	34	34.0	29	29.0	63
1st Division	51	51.0	53	53.0	104

Source: Field Survey, 2024



The academic achievement of Class IX students of Kamrup Metropolitan, Assam, with respect to gender. The results reveal that both male and female students perform well in the science subject. Among males, 51% of students secured first division, 34% second division, and 15% achieved only a simple pass. Among females, 53% obtained first division, 29% second division, and 18% simple pass. The findings indicate that female students have a slightly higher percentage of first-division scores compared to males, suggesting stronger overall performance. However, the difference between genders is not large, showing that both groups perform almost equally in academic achievement. Overall, it can be inferred that students of both genders maintain good academic standing, with a clear majority (over half) achieving first division. The results also indicate that the performance gap between males and females is minimal, reflecting balanced academic progress in science education among Class IX students in Kamrup Metropolitan, Assam.

Table 5: Correlation between Academic Achievement and Scientific Attitude

Dimension	Pearson r	p-value	Remarks
Rationality	0.182	0.009	Significant
Curiosity	0.325	0.000	Significant
Open-Mindedness	0.245	0.001	Significant
Faith in Scientific Method	0.095	0.081	Not Significant
Aversion to Superstition	0.168	0.013	Significant
Overall Scientific Attitude	0.312	0.000	Significant

The results also revealed that a positive and significant correlation exists between academic achievement and most dimensions of scientific attitude, except faith in the scientific method. The overall correlation ($r = 0.312$) suggests that students with stronger scientific attitudes achieve better academic results in science subjects.



Table 5: Correlation between Academic Achievement and Scientific Attitude by Gender

Dimension	Male (r)	Remarks	Female (r)	Remarks
Rationality	0.208	Significant	0.122	Not Significant
Curiosity	0.288	Significant	0.354	Significant
Open-Mindedness	0.265	Significant	0.191	Significant
Faith in Scientific	0.141	Significant	0.042	Not Significant
Aversion to	0.197	Significant	0.108	Not Significant
Overall Scientific	0.334	Significant	0.284	Significant

Among male students, academic achievement is significantly related to all dimensions of scientific attitude. For females, the relationship is significant mainly for curiosity, open-mindedness, and overall scientific attitude. This shows that while a scientific attitude supports achievement for both genders, the influence is more consistent among male students.

The study concludes that both male and female students possess a moderate level of scientific attitude. Males tend to perform better in rationality and rejection of superstition, whereas females exhibit stronger curiosity and a greater belief in scientific methods. A moderate positive correlation exists between scientific attitude and academic achievement, indicating that nurturing curiosity and critical thinking can improve science performance among students.

Educational Implications

Based on the findings of the study, several educational implications can be drawn to enhance students' scientific attitude and academic achievement:

1) Since curiosity and rationality are strongly associated with higher academic achievement, science teachers should adopt inquiry-based and experimental learning methods. Encouraging students to ask questions, explore problems, and find solutions independently can foster curiosity and deeper understanding.



- 2) As rationality and open-mindedness correlate positively with academic achievement, educators should integrate reasoning-based discussions and problem-solving exercises into classroom activities. This will help students make logical decisions and approach problems scientifically.
- 3) The results show minor gender differences in specific dimensions of scientific attitude. Teachers should ensure that classroom activities promote equal participation of both male and female students. Providing role models and examples of successful scientists from both genders can help reduce any hidden gender bias and promote balanced development.
- 4) Males showed a stronger aversion to superstition, while females demonstrated higher faith in scientific methods. Teachers should integrate lessons that challenge irrational beliefs and emphasise evidence-based reasoning to strengthen students' scientific outlook.
- 5) Since "faith in the scientific method" does not correlate strongly with achievement, educators should focus on demonstrating how scientific methods lead to real-life discoveries and innovations. Practical experiments and project-based activities can make students experience the power of scientific inquiry firsthand.
- 6) The study found a significant positive relationship between scientific attitude and academic achievement. Schools should, therefore, treat attitude development as an essential educational objective. Regular workshops, science exhibitions, and peer group discussions can motivate students to adopt scientific thinking, ultimately improving their academic performance.
- 7) Teachers play a key role in shaping students' scientific attitudes. Regular training programs should be organised to help teachers adopt effective teaching strategies, such as using real-life examples, debates, and problem-solving tasks that promote curiosity and logical reasoning among students.
- 8) The curriculum should include components that explicitly aim to develop a scientific attitude, such as inquiry-based projects, critical thinking exercises, and reflection on ethical aspects of science. Integrating attitude-building activities within science subjects can make learning more meaningful and relevant.



9) Parents and the community should also be engaged in promoting scientific attitudes among children. Awareness programs can help families understand the importance of encouraging curiosity, questioning, and evidence-based thinking at home.

10) Schools should develop an environment that values curiosity, experimentation, and open-mindedness. Establishing science clubs, conducting fairs, and celebrating National Science Day can create enthusiasm and foster a culture of scientific thinking among students.

V. Conclusion:

The study found that most Class IX students possess a moderate level of scientific attitude, showing interest in science but with scope for further improvement. Gender differences were minimal, with both boys and girls displaying similar attitudes and academic performance in science. A positive correlation was observed between scientific attitude and academic achievement, indicating that students with stronger scientific attitudes perform better academically. The study emphasises promoting inquiry-based learning and critical thinking to enhance both scientific attitude and academic success.

References:

- 1] Ahuja, S. (2017). *Scientific attitude and academic achievement among secondary school students*. Journal of Educational Research and Extension, 54(2), 45–52.
- 2] Aikin, W. M., & Aikin, A. M. (1996). *Scientific attitude and the method of science*. Harper & Row.
- 3] Banerjee, R. (2019). *Influence of Scientific Attitude on Academic Achievement among Higher Secondary Students*. International Journal of Applied Educational Research, 8(1), 110–118.
- 4] Banerjee, S. (2022). *Scientific attitude, social behaviour, and academic performance of secondary students*. Educational Innovations Quarterly, 12(4), 72–80.
- 5] Bettaswamy, M., & Kumar, R. (2022). *Gender differences in scientific attitude and academic performance among high school students*. Journal of Education and Practice, 13(2), 89–96.



- 6] Bhat, M. A., & Bhardwaj, A. (2014). *Academic achievement: Concept and measurement*. Global Academic Research Journal, 2(1), 56–63.
- 7] Bolt, S. (2011). *Measuring student achievement: A practical approach*. Routledge.
- 8] Carter, V. (1959). *Principles of educational measurement*. McGraw-Hill.
- 9] Chaplin, J. P. (n.d.). *Dictionary of Psychology*. Dell Publishing.
- 10] D'Souza, P. (2020). *Relationship between scientific attitude and academic achievement among secondary school students*. Asian Journal of Education and Development, 9(3), 65–73.
- 11] Drew, C. (2023). *Indicators of academic achievement in modern education*. Educational Psychology Today, 15(2), 33–49.
- 12] Ebel, R. L. (1997). *Measuring educational achievement and attitude*. Prentice Hall.
- 13] Hunashal, R. (2013). *Scientific attitude and achievement in science among secondary students*. Indian Journal of Education and Psychology, 7(1), 56–63.
- 14] Imran, M., Singh, K., & Rahman, T. (2019). *Correlation between scientific attitude and academic performance among secondary learners*. Journal of Educational Studies, 11(2), 78–84.
- 15] Kapoor, S. K. (1969). *Academic performance and educational achievement*. Journal of Educational Review, 21(3), 147–155.
- 16] Kavitha, M. (2015). *Scientific attitude and academic achievement of higher secondary students*. Indian Journal of Applied Research, 5(4), 23–26.
- 17] Kumar, A. (2019). *Scientific aptitude and achievement among students of North-East India*. North Eastern Educational Review, 4(2), 34–41.
- 18] Kumari, M. (2013). *Scientific attitude and achievement motivation among secondary school students*. International Journal of Education, 3(1), 77–83.
- 19] Kumari, S., Rima, P., & Gangrade, M. (2025). *Impact of scientific attitude on student performance: A comparative study*. Journal of Science Education Research, 18(1), 101–114.
- 20] Lacap, M. (2015). *Scientific attitude and achievement in science among secondary school students in the Philippines*. Asia-Pacific Journal of Educational Research, 6(3), 88–95.



- 21] Lyndem, B. (2014). *A study on the relation between scientific attitude and academic achievement of high school students*. Shillong Journal of Education, 9(2), 24–32.
- 22] Mohan, R. (2023). *Scientific attitude, self-concept, and social behaviour as predictors of academic achievement*. International Journal of Psychology and Education, 13(2), 58–70.
- 23] Myrten, L. (2013). *Scientific aptitude and academic performance in science subjects*. Journal of Educational Research, 5(2), 43–50.
- 24] Olasehinde, K. J., &Olatoye, R. A. (2014). *Scientific attitude, attitude to science, and science achievement of senior secondary school students in Katsina State, Nigeria*. Journal of Educational and Social Research, 4(1), 445–453.
<https://doi.org/10.5901/jesr.2014.v4n1p445>
- 25] Patel, S. (2021). *The role of scientific attitude in promoting academic excellence*. Contemporary Educational Studies, 7(2), 92–103.
- 26] Rajendran, R. (2007). *Gender differences in scientific attitude and achievement among secondary school students*. Indian Journal of Education, 52(3), 39–46.
- 27] Rima, P., &Gangrade, M. (2024). *Scientific Attitude and Academic Success among Adolescents*. Journal of Educational Development and Research, 10(1), 25–36.
- 28] Schmaus, W. (2020). *The philosophy of science and the scientific attitude*. Cambridge University Press.
- 29] Shanthi, M. (2014). *Scientific process skills and academic performance among high school students*. International Journal of Educational Psychology, 3(1), 66–73.
- 30] Sharma, P., & Yadav, R. (2023). *Gender and Locality Differences in Scientific Attitude and Achievement*. Journal of Progressive Education, 14(2), 52–61.
- 31] Singh, P., Kaur, H., & Gupta, R. (2016). *Correlation between scientific attitude and academic achievement in science among secondary school students*. Indian Educational Review, 54(1), 95–103.
- 32] Srivastava, A. (2014). *Scientific attitude and its influence on student performance in science subjects*. Indian Journal of Research in Education, 5(1), 44–50.
- 33] Vani, S. (2019). *A study on scientific attitude and academic performance among school students*. Journal of Educational Perspectives, 8(2), 31–40.