

ATTITUDE TOWARD SCIENCE AND ITS RELATIONSHIP WITH ACADEMIC OUTCOMES OF GRADE 9 LEARNERS OF TABON M. ESTRELLA NATIONAL HIGH SCHOOL, BISLIG CITY DIVISION: A DESCRIPTIVE-CORRELATIONAL STUDY

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ABSTRACT

This study examined the attitude toward science and its relationship with academic outcomes among Grade 9 learners of Tabon M. Estrella National High School, Bislig City Division, for School Year 2025-2026. Grounded in the Theory of Planned Behavior, Expectancy-Value Theory, and the affective domain framework of Bloom and Krathwohl, the study used a quantitative descriptive-correlational design. The respondents were 244 Grade 9 learners selected through total enumeration. Attitude data were gathered through an adapted version of Fraser's Test of Science-Related Attitudes (TOSRA), while academic outcomes were based on official first-quarter science grades. Mean, standard deviation, frequency, percentage, and Spearman rho were used in the analysis. Findings showed a very high overall attitude toward science ($M = 3.45$). Six of the seven attitude dimensions were rated very high, while Leisure Interest in Science was rated high ($M = 3.22$). Academic outcomes were generally strong: 49.2% of the learners were Outstanding, 25.4% were Very Satisfactory, 14.3% were Satisfactory, 8.6% were Fairly Satisfactory, and 2.5% did not meet expectations. Overall attitude toward science was moderately, positively, and significantly related to first-quarter science grade category ($\rho = .34, p < .001$). The strongest associations were found for Enjoyment of Science Lessons ($\rho = .36$) and Career Interest in Science ($\rho = .32$), followed by Social Implications of Science ($\rho = .30$) and Attitude Toward Scientific Inquiry ($\rho = .27$). The findings suggest that students' classroom enjoyment, perceived relevance of science, and future orientation in science are meaningfully associated with better academic outcomes. The study recommends inquiry-rich teaching, relevance-oriented classroom practices, and school-based science enrichment programs that strengthen both affective engagement and academic performance.

Keyword: Attitude Toward Science, Academic Outcomes, TOSRA, Grade 9 Learners, Science Achievement, Descriptive-Correlational

1. INTRODUCTION

Science education continues to face a dual challenge: raising achievement and sustaining positive learner dispositions toward the subject. International evidence shows that many children and adolescents still fail to reach minimum learning proficiency, and these foundational gaps affect success in conceptually demanding subjects such as science (UNESCO Institute for Statistics, 2017; World Bank et al., 2022; OECD, 2023). Across Southeast Asia, several developing systems, including the Philippines, remain below the OECD average in science performance, underscoring continuing concerns about scientific literacy and school achievement (World Bank, 2020; OECD, 2023).

The Philippine context reflects this concern clearly. In PISA 2018 and 2022, Filipino learners placed near the bottom in science, and large proportions remained below baseline proficiency despite modest gains in the latter cycle

(Department of Education, 2019; Congressional Policy and Budget Research Department, 2024). In Caraga, science performance has likewise remained a challenge, with regional analyses showing a low proportion of learners reaching acceptable science proficiency levels, even as recent indicators suggest gradual improvement (Cordon, 2020; Lopez, 2024). These conditions point to the need for school-level evidence that can help explain why some learners perform better than others within the same public-school setting.

One important explanatory variable is attitude toward science. Attitudes are commonly understood as evaluations shaped by beliefs, feelings, and behavioral tendencies toward an object or experience (Eagly & Chaiken, 1993). In science education, attitude toward science includes learners' views of science as socially useful, their enjoyment of science lessons, their perceptions of scientists, their orientation toward scientific inquiry, and their willingness to engage in science in leisure activities and future careers (Osborne et al., 2003; Fraser, 1981). Fraser's TOSRA offers a multidimensional way of examining these perspectives through seven domains: Social Implications of Science, Normality of Scientists, Attitude Toward Scientific Inquiry, Adoption of Scientific Attitudes, Enjoyment of Science Lessons, Leisure Interest in Science, and Career Interest in Science (Fraser, 1981).

Recent studies support the importance of these attitudes for achievement. A three-level meta-analysis found a positive and moderate relationship between attitude toward science and science achievement (Mao et al., 2021). More recent studies in Asian and Philippine settings have likewise shown that more favorable attitudes are associated with stronger inquiry, higher science grades, and better engagement in science learning (Ramos & Israel, 2024; Taghap & Mannan Addani, 2024; Candia & Lay, 2025; Limbaga & Borlio, 2025). However, localized studies in the Bislig City Division remain scarce, and few investigations use the full TOSRA structure together with official quarterly science grades.

This study addressed that gap by examining the attitude toward science and its relationship with the academic outcomes of Grade 9 learners of Tabon M. Estrella National High School, Bislig City Division, for School Year 2025-2026. Specifically, the study described learners' attitudes across the seven TOSRA dimensions, described their first-quarter science grade distribution, and tested whether a significant relationship existed between attitude toward science and academic outcomes.

2. METHODOLOGY

Research Design. A quantitative descriptive-correlational design was employed to describe the levels of attitude toward science and determine whether a significant relationship existed between attitude scores and academic outcomes, without manipulating the variables (Creswell & Creswell, 2018).

Research Locale and Respondents. The study was conducted at Tabon M. Estrella National High School, a public secondary school in Bislig City Division, Caraga Region, Philippines. The respondents were all 244 Grade 9 learners enrolled for School Year 2025-2026, composed of 136 males and 108 females. Because the target population was manageable, total enumeration was applied.

Instrument and Measures. Attitude toward science was measured through an adapted version of Fraser's TOSRA consisting of 70 items distributed across seven dimensions. Responses were rated on a 4-point Likert scale from 1 (Strongly Disagree) to 4 (Strongly Agree). Mean scores were interpreted as follows: 3.26-4.00 Very High, 2.51-3.25 High, 1.76-2.50 Moderate, and 1.00-1.75 Low. Academic outcomes were operationalized as the learners' official first-quarter science grades and classified into Outstanding (90-100), Very Satisfactory (85-89), Satisfactory (80-84), Fairly Satisfactory (75-79), and Did Not Meet Expectations (below 75).

Data Collection and Analysis. After securing approval from the Schools Division Superintendent and the school head, the researcher administered the questionnaire in face-to-face sessions with parental consent and learner assent. First-quarter science grades were retrieved from official school records in accordance with data privacy protocols. Mean and standard deviation were used to describe attitude levels, while frequency and percentage were used for the grade distribution. Spearman rho was applied to test the relationship between the overall and dimension-specific attitude scores and the first-quarter science grade category at $p < .05$. Data were processed using SPSS.

3. RESULTS AND DISCUSSION

Problem 1: Level of Attitude Toward Science. The Grade 9 learners demonstrated a generally very favorable attitude toward science. The overall mean across the 70 TOSRA items was 3.45, interpreted as Very High, suggesting that positive science-related attitudes were consistently evident among the respondents.

Table 1
Descriptive Statistics for Attitude Toward Science by Dimension (n = 244)

Dimension	M	Interpretation
Social Implications of Science	3.54	Very High
Normality of Scientists	3.50	Very High
Attitude Toward Scientific Inquiry	3.36	Very High
Adoption of Scientific Attitudes	3.54	Very High
Enjoyment of Science Lessons	3.56	Very High
Leisure Interest in Science	3.22	High
Career Interest in Science	3.41	Very High

Note. Scale: 3.26-4.00 = Very High; 2.51-3.25 = High; 1.76-2.50 = Moderate; 1.00-1.75 = Low.

Six of the seven dimensions were rated Very High. The highest mean was recorded for Enjoyment of Science Lessons (M = 3.56), followed closely by Social Implications of Science and Adoption of Scientific Attitudes (M = 3.54). Leisure Interest in Science obtained a High rating (M = 3.22), suggesting that students were generally more positive about classroom-based and future-oriented science experiences than about science-related engagement during their free time. This pattern is consistent with studies showing that school-based science attitudes often exceed leisure-based participation in science activities (Aznam et al., 2022; Gkagkas et al., 2025).

At the item level, the strongest endorsements centered on the importance of science in solving environmental problems, curiosity about how things work, the desire to know the truth, and curiosity about new scientific discoveries. Weaker responses were observed on statements about science helping reduce poverty and hunger, on rejecting stereotypes that scientists are strange, and on informal engagement such as talking about science at home or visiting science museums. The findings suggest that the learners strongly value science in school and in society, but still have room for richer informal science exposure and more inclusive images of scientists.

Problem 2: Level of Academic Outcomes in Science. Academic outcomes were measured through the respondents' first-quarter science grades. The results indicate a generally strong performance profile for the Grade 9 cohort.

Table 2
First-Quarter Science Grade Classification (n = 244)

Category	Grade Range	n	%
Outstanding	90-100	120	49.2
Very Satisfactory	85-89	62	25.4
Satisfactory	80-84	35	14.3
Fairly Satisfactory	75-79	21	8.6
Did Not Meet Expectations	< 75	6	2.5
Total		244	100.0

Note. Percentages are based on N = 244 and rounded to one decimal place.

Almost half of the learners (49.2%) obtained Outstanding grades in Science, while 25.4% were Very Satisfactory and 14.3% were Satisfactory. Only 8.6% were Fairly Satisfactory and 2.5% did not meet expectations. Overall, 217 of the 244 learners, or about 89%, obtained at least a Satisfactory rating. These results show that most learners met

or exceeded the expected first-quarter competencies in Science. Although quarterly grades are context-specific and should not be treated as identical to large-scale standardized scores, the distribution suggests a relatively strong science performance profile for this cohort.

Problem 3: Relationship Between Attitude Toward Science and Academic Outcomes. Spearman rho was used to test the association between the attitude variables and the first-quarter science grade category. The results showed a positive and statistically significant relationship between attitude toward science and academic outcomes.

Table 3

Spearman Correlations Between Attitude Toward Science and First-Quarter Science Grade Category (n = 244)

Attitude Variable	rho	p	Interpretation
Overall attitude toward science	.34	< .001	Moderate positive, significant
Social Implications of Science	.30	< .001	Small-to-moderate positive
Normality of Scientists	.17	.008	Small positive, significant
Attitude Toward Scientific Inquiry	.27	< .001	Small-to-moderate positive
Adoption of Scientific Attitudes	.24	< .001	Small positive, significant
Enjoyment of Science Lessons	.36	< .001	Moderate positive, strongest
Leisure Interest in Science	.13	.040	Small positive, marginal
Career Interest in Science	.32	< .001	Moderate positive

Note. Small correlations are approximately .10-.29, and moderate correlations are approximately .30-.49 in absolute value.

The overall attitude toward science was moderately, positively, and significantly related to first-quarter science grade category ($\rho = .34, p < .001$). The strongest associations were found for Enjoyment of Science Lessons ($\rho = .36$) and Career Interest in Science ($\rho = .32$). Social Implications of Science ($\rho = .30$) and Attitude Toward Scientific Inquiry ($\rho = .27$) also showed meaningful positive relationships with academic outcomes. Adoption of Scientific Attitudes, Normality of Scientists, and Leisure Interest in Science were positively related as well, although their correlations were smaller.

The pattern suggests that classroom enjoyment, perceived relevance of science, and future orientation in science may be especially important for early-quarter performance. These findings align with previous evidence showing that learners who enjoy science, value its usefulness, and can imagine science-related futures tend to achieve better academic outcomes (Mao et al., 2021; Taghap & Mannan Addani, 2024; Candia & Lay, 2025; Limbaga & Borlio, 2025). The weaker associations for Normality of Scientists and Leisure Interest in Science imply that stereotype reduction and out-of-school engagement remain important, but may be less directly connected to immediate classroom grades than enjoyment and perceived relevance.

4. CONCLUSIONS

Grade 9 learners of Tabon M. Estrella National High School demonstrated very positive attitudes toward science overall. Their strongest patterns were found in enjoyment of science lessons, recognition of the social value of science, adoption of scientific ways of thinking, and interest in science-related careers.

Academic outcomes in Science were generally strong. Nearly nine out of ten learners obtained at least a Satisfactory first-quarter grade, and almost half attained Outstanding performance.

Attitude toward science was significantly and positively related to academic outcomes. Learners who reported more favorable attitudes, particularly in enjoyment of science lessons and career interest in science, tended to belong to higher first-quarter science grade categories.

Classroom-centered and future-oriented attitudes appear to matter more for immediate science performance than leisure-based engagement alone. This highlights the importance of teaching approaches that make science enjoyable, inquiry-rich, relevant, and personally meaningful.

5. RECOMMENDATIONS

Science teachers may continue to design inquiry-rich and context-based lessons that make science enjoyable while connecting concepts to real-world issues, local concerns, and problem-solving situations.

Schools may strengthen science clubs, fairs, laboratory exposure, career talks, and interactions with diverse science role models to expand learners' interest in science beyond the classroom and reduce limiting stereotypes about scientists.

School administrators and supervisors may monitor both attitude and achievement data as part of science program improvement so that sections or learners needing motivational and instructional support can be identified early.

Future studies may include variables such as science self-efficacy, anxiety, classroom climate, parental support, or access to learning resources, and may replicate the study in other schools and divisions for broader comparison.

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