SCIENTIFIC APTITUDE AND CLASSROOM BEHAVIOUR AS PREDICTORS OF ACHIEVEMENT IN SCIENCE AMONG SECONDARY SCHOOL STUDENTS

[1]Ms. Sindhu R.S., [2]Dr. Biju G. & [3]Dr. Suhirtha Rani R
[1]Research Scholar, VISTAS, Pallavaram, Chennai
[2]Principal, K.P.M.B.Ed. College, Cheriyavelinalloor, Kollam, Kerala
[3]Dr. Suhirtha Rani R., Assistant Professor, VISTAS, Pallavaram, Chennai

ABSTRACT

Science education plays a significant role in developing scientific temper, logical reasoning, problem-solving skills, and the ability to make informed decisions. Achievement in science is influenced by several cognitive, behavioural, psychological, and environmental factors. Among these, scientific aptitude and classroom behaviour are important factors that may contribute to differences in students' academic performance. Scientific aptitude refers to an individual's potential to understand scientific concepts, identify relationships, interpret information, and solve problems using scientific reasoning. Classroom behaviour includes students' participation, attention, cooperation, discipline, task completion, and engagement in classroom learning activities.The present study proposes to examine scientific aptitude and classroom behaviour as predictors of achievement in science among secondary school students. A quantitative, descriptive-correlational research design is proposed. The hypothetical methodology involves a sample of 200 secondary school students selected through an appropriate sampling procedure. Scientific aptitude may be assessed using a suitable standardized test, classroom behaviour through a structured rating scale, and science achievement through students' examination scores. Pearson's product-moment correlation and multiple regression analysis are proposed to determine the relationships between the variables and their predictive contribution. An illustrative statistical analysis indicates that scientific aptitude and classroom behaviour may jointly explain approximately 42.6% of the variance in science achievement.

Keywords: Scientific Aptitude, Classroom Behaviour, Achievement in Science, Predictors, Secondary School Students

INTRODUCTION

Education is an important means of developing the intellectual, social, emotional, and practical abilities of learners. At the secondary school level, science education helps students understand natural phenomena, develop rational thinking, acquire scientific knowledge, and apply learning to everyday situations. It also encourages curiosity, observation, experimentation, evidence-based reasoning, and problem-solving. However, students differ considerably in their achievement in science. Some students understand scientific principles easily and apply them successfully, while others experience difficulties in interpreting concepts, solving problems, and connecting theoretical knowledge with practical situations. Differences in science achievement cannot be explained by intelligence or previous examination marks alone. Students' aptitude, interest, motivation, study habits, classroom participation, teacher support, learning opportunities, and home environment may also influence their academic performance. Therefore, identifying factors associated with science achievement is essential for improving the effectiveness of science teaching and learning. Scientific aptitude is one such factor. It refers to a learner's potential to acquire scientific knowledge and perform tasks involving scientific reasoning. It may involve numerical ability, logical thinking, interpretation of data, recognition of patterns, understanding of relationships, and the ability to draw conclusions from observations. Students with stronger scientific aptitude may find it easier to understand scientific concepts, formulate hypotheses, interpret experimental results, and solve unfamiliar problems. Nevertheless, aptitude should not be regarded as a fixed or unchangeable ability. Appropriate teaching strategies, practical experiences, encouragement, and learning opportunities can help students develop their scientific competencies. Classroom behaviour is another important factor associated with learning outcomes. A classroom is a social and educational environment in which students interact with teachers, classmates, learning materials, and activities. Students who listen attentively, ask questions, participate in discussions, complete assignments, cooperate with peers, and follow classroom instructions are likely to obtain more opportunities to learn. Conversely, frequent distraction, lack of participation, incomplete work, and disruptive behaviour may reduce learning time and interfere with understanding.Scientific aptitude and classroom behaviour may influence science achievement both independently and jointly. A student with high aptitude may not achieve the expected level of performance if the student rarely participates in learning activities. Similarly, a highly attentive and cooperative student may still need additional support in scientific reasoning or conceptual understanding. Examining both variables together can therefore provide a broader understanding of science achievement.The present paper focuses on the potential predictive relationship between scientific aptitude, classroom behaviour, and achievement in science among secondary school students. It also discusses the theoretical foundations, research methodology, illustrative statistical analysis, and educational implications of these relationships.

STATEMENT OF THE PROBLEM

Students' achievement in science varies across individuals and classrooms. Although curriculum, teaching methods, and available learning resources influence academic performance, differences in scientific aptitude and classroom behaviour may also contribute to these variations. Scientific aptitude may help students understand scientific relationships and solve problems, whereas positive classroom behaviour may provide greater opportunities for participation, feedback, practice, and conceptual development. However, teachers require a clearer understanding of how these two variables are related to science achievement and whether they can jointly predict students' performance. Such knowledge can help teachers identify students who need additional support and plan appropriate instructional interventions. Therefore, the problem of the present study is stated as **"Scientific Aptitude and Classroom Behaviour as Predictors of Achievement in Science Among Secondary School Students."**

THEORETICAL FRAMEWORK

Scientific Aptitude: Scientific aptitude refers to the potential of an individual to learn, understand, and apply scientific knowledge and processes. It includes abilities that support the interpretation of scientific information and the solution of problems through logical and evidence-based reasoning. The major components of scientific aptitude include:

Logical reasoning: Identifying relationships between facts and drawing reasonable conclusions.

1. **Numerical ability:** Understanding quantitative relationships, measurements, calculations, and numerical data.
2. **Scientific reasoning:** Formulating hypotheses, identifying variables, testing explanations, and evaluating evidence.
3. **Observation and interpretation:** Recognizing relevant information and explaining observed phenomena.
4. **Spatial and analytical ability:** Understanding structures, diagrams, models, and relationships between different parts of a system.
5. **Problem-solving ability:** Applying scientific principles to familiar and unfamiliar situations.

Scientific aptitude may support achievement because science requires students to connect facts, interpret evidence, and understand causal relationships. For example, a student studying blood circulation must understand the relationships among the heart, blood vessels, lungs, and body tissues. A student learning chemical reactions must recognize patterns, interpret symbols, and understand the relationship between reactants and products.However, scientific aptitude does not guarantee academic success. Students also require motivation, effective learning strategies, adequate teaching,

practice, and opportunities to apply their knowledge. Aptitude is best understood as one potential contributor to achievement rather than its only determinant.

Classroom Behaviour: Classroom behaviour refers to the observable actions and patterns of participation displayed by students during teaching-learning activities. It includes behaviours that facilitate learning as well as behaviours that may interrupt it.Positive classroom behaviours include attentive listening, asking relevant questions, participating in experiments, completing assignments, cooperating with classmates, following instructions, and responding constructively to feedback. These behaviours increase students' opportunities to engage with educational content and receive clarification when difficulties arise. Negative or less productive classroom behaviours may include frequent distraction, avoidance of learning tasks, repeated interruption, lack of preparation, and unwillingness to participate. Such behaviours may reduce the time available for meaningful learning. Classroom behaviour should not be interpreted only in terms of obedience or silence. A student who asks challenging questions, expresses disagreement respectfully, or proposes an alternative explanation may display highly productive scientific engagement. Similarly, quietness does not necessarily indicate poor learning. Teachers should therefore assess classroom behaviour in relation to learning engagement, cooperation, task completion, and constructive participation.

Achievement in Science: Achievement in science refers to the level of knowledge, understanding, and skills demonstrated by students in science-related learning tasks. It is commonly measured through written examinations, standardized achievement tests, practical assessments, assignments, and other curriculum-based evaluations.Science achievement may include remembering scientific facts, explaining concepts, applying principles, interpreting diagrams, analysing experimental results, solving numerical problems, and evaluating scientific explanations.A comprehensive assessment should measure more than factual recall. It should also assess students' ability to apply scientific knowledge to everyday situations and interpret evidence logically.

Relationship Between Scientific Aptitude and Science Achievement: Scientific aptitude may contribute to science achievement by helping students process information, understand abstract ideas, identify relationships, and solve problems. Students with stronger reasoning skills may find it easier to interpret graphs, understand experimental procedures, and apply principles in unfamiliar situations. Dar and Majid (2022) examined scientific aptitude and science achievement among 200 economically disadvantaged Class X students in Anantnag district, Jammu and Kashmir. Their study reported significant differences in science achievement among students with different levels of scientific aptitude. This provides relevant evidence that aptitude deserves attention when examining differences in science achievement. However, the findings from that particular sample should not automatically be generalized to every student population.

Relationship Between Classroom Behaviour and Science Achievement: Classroom behaviour can influence achievement by determining how actively students engage with teaching and learning opportunities. Students who participate in practical activities, seek clarification, complete assignments, and use feedback may develop stronger conceptual understanding. McGarity and Butts (1984) investigated teacher classroom management, student engagement, academic aptitude, and science achievement among middle and high school science students. Their study reported significant relationships among the variables and identified several classroom management behaviours associated with engagement and achievement. These included maintaining learner involvement, providing feedback, using instructional time effectively, and responding to students who did not understand directions.Research on teacher-student interactions has also found that classroom interactions characterized by emotional support, responsiveness to students, engaging learning formats, and an emphasis on analysis and problem-solving are associated with better academic outcomes. Allen and colleagues' research on secondary classrooms provides further support for considering the classroom environment when studying achievement.

Joint Contribution of Scientific Aptitude and Classroom Behaviour: Scientific aptitude and classroom behaviour may be related, but they represent different aspects of learning. Scientific aptitude concerns students' potential to reason and solve scientific problems, whereas classroom behaviour concerns how students engage with learning activities. A student may possess strong aptitude but show limited classroom engagement. Another student may demonstrate consistent participation but require additional support in analytical reasoning. Considering both variables together may therefore explain science achievement more effectively than examining either variable alone.Multiple regression analysis can estimate the unique statistical contribution of each predictor while accounting for the other predictor. Nevertheless, predictive relationships do not establish that either variable directly causes achievement.

REVIEW OF RELATED LITERATURE

Dar and Majid (2022) studied scientific aptitude as a predictor of science achievement among economically disadvantaged secondary school students. The researchers used a sample of 200 Class X students from Anantnag district, Jammu and Kashmir. Their findings indicated significant differences in science achievement among students with different levels of scientific aptitude. The study highlights the importance of examining aptitude in educational settings where students may have unequal access to learning resources.Verma and Gupta (2024) reviewed scientific aptitude in Indian secondary education and discussed its measurement, significance, and implications for science learning. Their review emphasized the relevance of scientific aptitude to the development of scientific competence and identified areas requiring further research. The review also supports the need to investigate aptitude alongside other educational and classroom-related variables.

McGarity and Butts (1984) studied relationships among classroom management behaviour, student engagement, academic aptitude, and science achievement. The study involved experienced science teachers and students from middle and high school settings. The researchers reported significant relationships among these variables. Their findings suggest that effective management, constructive feedback, and sustained student involvement are relevant to science learning.Allen and colleagues' research on secondary classroom interactions found that the quality of teacher-student interactions was associated with subsequent academic achievement after accounting for students' prior performance. The findings indicate that classroom climate and instructional interactions are important factors to consider when explaining student outcomes.

RESEARCH GAP

The reviewed studies provide evidence concerning scientific aptitude, classroom engagement, and science achievement. However, findings from different populations, educational systems, and measurement procedures cannot be assumed to apply equally to all secondary school settings. There is a need for context-specific studies that examine scientific aptitude and classroom behaviour together among secondary school students. Such research should use clearly defined measures, reliable assessment procedures, appropriate statistical analysis, and representative sampling wherever possible. The present study proposes to address this need by examining the relationship of both predictors with science achievement and estimating their combined predictive contribution.

NEED AND SIGNIFICANCE OF THE STUDY

The present study may help science teachers understand the cognitive and behavioural factors associated with students' academic performance. Knowledge of these factors can inform classroom planning and assessment. Second, the study may help teachers identify students who possess scientific potential but are not fully engaging with classroom activities. Appropriate encouragement, structured participation, and individual guidance may help such students benefit more from instruction. Third, the study may support the design of learning experiences that develop scientific reasoning. Activities involving observation, experimentation, data interpretation, group discussion, and problem-solving can provide opportunities to strengthen scientific competencies. Fourth, the study may encourage teachers to develop positive classroom environments in which students feel comfortable asking questions, making mistakes, expressing ideas, and learning from feedback. Finally, the study may provide a basis for further research on other predictors of science achievement, including motivation, interest, prior achievement, socioeconomic background, teacher support, and access to learning resources.

OBJECTIVES OF THE STUDY

1. To find out the level of scientific aptitude of secondary school students.
2. To find out the classroom behaviour of secondary school students.
3. To determine the level of achievement in science among secondary school students.
4. To find out the relationship between scientific aptitude and science achievement.
5. To find out the relationship between classroom behaviour and science achievement.
6. To find out the predictive efficiency of scientific aptitude and classroom behavior on Achievement in Science of secondary school students

HYPOTHESES OF THE STUDY

1. There exists a significant relationship between scientific aptitude and achievement in science among secondary school students.
2. There exists a significant relationship between classroom behaviour and achievement in science among secondary school students.
3. Scientific aptitude and Classroom behavior can significantly predict achievement in science of secondary school students

METHODOLOGY

RESEARCH DESIGN

A quantitative, descriptive-correlational research design is proposed. This design is appropriate because the study seeks to examine relationships among variables and estimate their predictive contribution without manipulating students' aptitude or classroom behaviour.The study would not establish cause-and-effect relationships. It would identify statistical associations and predictive relationships within the sample.

POPULATION

The population would consist of secondary school students studying in Classes IX and X in the selected geographical area. The precise population should be defined according to the schools and academic year included in the actual research.

SAMPLE AND SAMPLING TECHNIQUE

For the illustrative analysis, a sample of 200 secondary school students is assumed. In an actual investigation, students may be selected through stratified random sampling or another appropriate sampling technique, depending on school access and the research objectives.If students

are selected from several schools, the researcher should consider differences between schools and classrooms during sampling and statistical analysis.

VARIABLES OF THE STUDY

The independent or predictor variables are:

- Scientific aptitude.
- Classroom behaviour.

The dependent variable is:

- Achievement in science.

TOOLS FOR DATA COLLECTION

Scientific Aptitude Test: A suitable standardized scientific aptitude test may be used to assess reasoning, interpretation, numerical relationships, and scientific problem-solving. The researcher should verify its validity, reliability, suitability for the students' age group, and permission requirements.

Classroom Behaviour Rating Scale: A structured rating scale may be used to assess attention, participation, cooperation, task completion, constructive questioning, and engagement in classroom activities. Clear behavioural indicators and consistent rating procedures are essential. If possible, more than one trained observer should rate a subset of students to examine inter-rater reliability.

Science Achievement Test: Achievement may be measured using a curriculum-aligned test or students' examination marks. If existing school examination scores are used, the researcher should consider differences in test difficulty and marking procedures across schools.

PROCEDURE FOR DATA COLLECTION

Permission should be obtained from the relevant school authorities before data collection. Where required, informed consent from parents or guardians and assent from students should be secured. The scientific aptitude test should be administered under standardized conditions. Classroom behaviour should be recorded over a suitable period rather than being based on a single observation. Science achievement scores should be obtained using an agreed and consistent procedure. All information should be coded to protect students' identities. The data should be checked for missing values, unusual scores, and entry errors before analysis.

STATISTICAL TECHNIQUES USED FOR THE STUDY

1. **Mean and standard deviation:** To describe the distribution of scores.
2. **Pearson's product-moment correlation:** To examine linear relationships among scientific aptitude, classroom behaviour, and science achievement, when its assumptions are reasonably satisfied.
3. **Multiple linear regression:** To estimate the unique and combined predictive contribution of scientific aptitude and classroom behaviour.
4. **Statistical significance testing:** To evaluate whether the observed relationships are inconsistent with the relevant null hypotheses.
5. **Effect-size interpretation:** To assess the practical importance of relationships, rather than relying only on p-values.

The researcher should check the assumptions of regression, including linearity, independence of errors, homoscedasticity, multicollinearity, and the influence of unusual observations.

ANALYSIS AND INTERPRETATION

It is provided to demonstrate the format and interpretation of statistical results for a sample of 200 students. The numbers are not drawn from an actual survey or student dataset.

Illustrative Correlation Analysis

Suppose the following Pearson correlation coefficients are obtained in an illustrative dataset.

Variables	Correlation (r)	Illustrative interpretation
Scientific aptitude and science achievement	0.60	Moderate-to-strong positive relationship
Classroom behaviour and science achievement	0.45	Moderate positive relationship
Scientific aptitude and classroom behaviour	0.35	Moderate positive relationship

The illustrative correlation of 0.60 between scientific aptitude and science achievement suggests that students with higher scientific aptitude scores tend to obtain higher science achievement scores. This association may reflect the relevance of reasoning, interpretation, and problem-solving abilities to science learning.The illustrative correlation of 0.45 between classroom behaviour and science achievement indicates that more constructive classroom engagement tends to accompany better science performance. Attentive participation, task completion, cooperation, and the use of feedback may provide students with greater opportunities to learn.The illustrative correlation of 0.35 between scientific aptitude and classroom behaviour suggests that the two predictors may be related. For example, students who understand classroom tasks may be more willing to participate.

However, the relationship is not so high as to imply that the variables are identical.Correlation does not prove causation. Other factors, including motivation, prior achievement, teacher support, and home learning conditions, may influence the observed relationships.

Multiple regression can be used to examine whether scientific aptitude and classroom behaviour jointly predict science achievement. Using the illustrative correlations in the previous table, the following standardized regression results can be demonstrated.

Predictor	Standardized beta (β)	Illustrative interpretation
Scientific aptitude	0.50	Stronger unique predictor
Classroom behaviour	0.27	Additional positive predictor

The standardized beta for scientific aptitude is approximately 0.50, while the beta for classroom behaviour is approximately 0.27. In this illustrative example, both variables have positive regression coefficients, and scientific aptitude has the larger standardized coefficient.This means that, when the other predictor is held constant statistically, scientific aptitude has the stronger estimated association with science achievement in this example. It does not mean that classroom behaviour is unimportant, nor does it establish that increasing either score will necessarily cause a specific increase in examination marks.

Model Summary

Statistical measure	Illustrative value
Sample size (N)	200
Multiple correlation (R)	0.652
Coefficient of determination (R^2)	0.426
Adjusted R^2	0.420
F-statistic	Approximately 73.0
Degrees of freedom	2 and 197
Illustrative significance	$p < .001$

The illustrative coefficient of determination, (R^2 = 0.426), indicates that scientific aptitude and classroom behaviour jointly account for approximately 42.6% of the variance in science achievement in this example. The adjusted (R^2) is approximately 0.420 after adjustment for the number of predictors and sample size. The illustrative F-statistic of approximately 73.0, with 2 and 197 degrees of freedom, indicates that the model would be statistically significant at $p < .001$ if these values arose from a dataset satisfying the model assumptions. This significance statement applies only to the illustrative mathematical example; it is not evidence from an actual sample. The

remaining 57.4% of the variance is not explained by these two predictors in the example. It may be associated with other variables, measurement error, random variation, and factors not included in the model. The unexplained proportion should not be interpreted as the contribution of any single factor.

TESTING THE HYPOTHESES

If an actual dataset produces statistically significant positive correlations, the relevant null hypotheses concerning those relationships may be rejected at the selected significance level. If a multiple regression model is statistically significant, the null hypothesis that the predictors jointly contribute no linear predictive information may also be rejected. However, individual regression coefficients should be examined separately, including their standard errors, confidence intervals, and p-values. A statistically significant overall model does not automatically mean that every predictor is individually significant. The researcher should also report the actual sample size, missing-data handling, confidence intervals, reliability of the measures, and any adjustments for school or classroom clustering where appropriate.

The hypothetical results demonstrate how scientific aptitude and classroom behaviour may be associated with science achievement and how regression analysis can estimate their combined predictive contribution. Scientific aptitude appears as the stronger predictor in the constructed example, while classroom behaviour adds further predictive information. These results are useful for demonstrating statistical reporting, but they cannot be used to claim that the same relationships exist among all secondary school students. Actual conclusions must be based on the data collected for the study.

EDUCATIONAL IMPLICATIONS OF THE STUDY

- Science teachers should provide opportunities for students to develop reasoning and problem-solving abilities. Activities involving classification, observation, experimentation, data interpretation, and hypothesis formation can help students understand scientific relationships. Instead of concentrating exclusively on textbook definitions, teachers can encourage students to explain why a phenomenon occurs, compare alternative explanations, and support conclusions with evidence.
- Teachers should establish clear expectations for participation, cooperation, task completion, and respectful communication. Classroom rules should support learning rather than discourage curiosity or questioning. Group activities, peer learning, collaborative experiments, and structured discussions can encourage students to participate actively. Students who are hesitant to speak should be provided with supportive opportunities to contribute.

- Inquiry-based learning, problem-based learning, project work, demonstrations, laboratory activities, and concept mapping may support both scientific reasoning and engagement. For example, when teaching plant transport, students can observe prepared materials, examine diagrams, predict outcomes, and explain the movement of water and dissolved substances. Such activities connect theoretical concepts with observable evidence.
- Teachers should use formative assessment to identify misconceptions and provide timely feedback. Students who experience difficulties in reasoning may benefit from guided examples, step-by-step explanations, additional practice, and peer support. Students who show limited classroom engagement may require individual encouragement, suitable learning tasks, or discussion about barriers to participation. Behavioural difficulties should not automatically be interpreted as a lack of aptitude or interest.
- Every student should receive meaningful opportunities to learn science, irrespective of background, gender, previous achievement, or learning difficulty. Teaching should offer different ways to participate, including oral discussion, written responses, visual representations, practical work, and collaborative activities. Aptitude tests and behaviour ratings should be used carefully. They should guide educational support rather than label students as permanently capable or incapable.
- Teacher education programmes should help teachers understand assessment, classroom observation, differentiated instruction, formative feedback, and scientific inquiry. Teachers should also learn how to interpret research findings cautiously and distinguish statistical prediction from causal explanation.

LIMITATIONS OF THE STUDY

The study has several limitations that should be considered when it is conducted. First, a correlational design cannot establish causal relationships. Even when scientific aptitude and classroom behaviour predict achievement statistically, other variables may influence the relationships. Second, the findings may be limited by the geographical area, school types, grade levels, and sampling procedure. A sample of 200 students may be suitable for some analyses, but adequacy depends on the model, expected effect sizes, measurement reliability, and sampling structure. Third, classroom behaviour ratings may be influenced by observer expectations and differences in classroom conditions. Standardized indicators and multiple observations can help reduce these limitations. Fourth, science achievement scores may not be directly comparable if students complete examinations of different difficulty levels or if marking standards vary. Fifth, the statistical analysis may be affected by missing data, measurement error, outliers, or violations of regression assumptions. These issues should be examined before drawing conclusions. Finally, the numerical statistical results presented in this paper are hypothetical. No actual student data were

supplied, and no empirical analysis has been conducted for the present title. Therefore, the results section must be updated after the researcher collects and analyses genuine data.

SUGGESTIONS FOR FURTHER RESEARCH

- Future studies may examine scientific aptitude and classroom behaviour across different school types, geographical regions, and grade levels. Researchers may also investigate whether the predictive relationships vary according to prior science achievement or access to laboratory and digital learning resources.Further studies could include additional variables such as scientific attitude, academic motivation, science self-efficacy, study habits, teacher support, and socioeconomic background. Longitudinal research could examine whether aptitude and classroom engagement predict changes in achievement over time.
- Intervention studies may also investigate whether inquiry-based learning, cooperative learning, structured classroom participation, or formative feedback improves students' scientific reasoning and achievement. Such studies would require appropriate comparison groups and stronger designs to support causal conclusions.

CONCLUSION

Scientific aptitude and classroom behaviour are important variables to consider when examining achievement in science among secondary school students. Scientific aptitude may support the understanding of scientific concepts, interpretation of evidence, logical reasoning, and problem-solving. Classroom behaviour may influence the extent to which students participate in learning activities, receive feedback, complete tasks, and benefit from instruction. Research on scientific aptitude and classroom engagement provides a basis for investigating these relationships. The literature suggests that aptitude, engagement, and effective classroom interactions are relevant to science achievement. Nevertheless, their relationships may differ across students and educational settings. The proposed study uses a descriptive-correlational design to investigate the relationship between scientific aptitude, classroom behaviour, and science achievement. Correlation and multiple regression are suitable techniques for examining these relationships when their assumptions are met. The illustrative statistical analysis demonstrates how the two predictors might jointly explain variation in achievement, with scientific aptitude showing a stronger standardized coefficient in the constructed example. The numerical values presented should not be interpreted as actual findings. Genuine conclusions require data collected from the intended student population and analysed using appropriate statistical procedures. The central educational implication remains that science teachers should develop students' scientific reasoning while creating supportive, engaging, and inclusive classroom environments. Combining opportunities for intellectual development with constructive classroom participation may help students make better use of science-learning opportunities and achieve their academic potential.

REFERENCES

1. Allen, J. P., Pianta, R. C., Gregory, A., Mikami, A. Y., & Lun, J. (2011). An interaction-based approach to enhancing secondary school instruction and student achievement. Science, 333(6045), 1034–1037. https://doi.org/10.1126/science.1207998
2. Dar, S. A., & Majid, I. (2022). Scientific aptitude as a predictor of achievement in science: A study of economically disadvantaged students. International Journal of Indian Psychology, 10(2). https://doi.org/10.25215/1002.018
3. McGarity, J. R., Jr., & Butts, D. P. (1984). The relationship among teacher classroom management behavior, student engagement, and student achievement of middle and high school science students of varying aptitude. Journal of Research in Science Teaching, 21(1), 55–61. https://doi.org/10.1002/tea.3660210107
4. Verma, R. K., & Gupta, S. (2024). Scientific aptitude in Indian secondary education: A comprehensive review and future directions. GYANODAYA – The Journal of Progressive Education, 17(1), 19–31. https://doi.org/10.5958/2229-4422.2024.00003.8