

## Academic Achievement among Senior Secondary Students: A Multivariate Analysis of Anxiety, Learning Styles, and Home Environment

Teena, Research Scholar, Singhania University, Pacheri Bari, Jhunjhunu, Rajasthan  
Dr. Rajpal Singh Yadav, Assistant Professor, Singhania University, Pacheri Bari,  
Jhunjhunu, Rajasthan

### Abstract

The present study examines academic achievement among senior secondary school students in relation to anxiety, learning styles, and home environment. Academic achievement is a key indicator of educational success; however, it is influenced by multiple psychological, cognitive, and socio-environmental factors. A normative survey method was employed for the study. A sample of **300 students** from Classes XI–XII was selected from government and private schools of Faridabad district using random sampling. Anxiety, learning styles, and home environment were treated as independent variables, while academic achievement, measured through Class XI examination scores, served as the dependent variable. Standardized tools, including the Comprehensive Anxiety Scale (Sinha & Sinha), Learning Style Inventory (Mishra), and Home Environment Inventory (Mishra), were used for data collection. Data were analyzed using descriptive statistics, Pearson's product–moment correlation, and independent samples t-test. The findings revealed a significant negative relationship between anxiety and academic achievement, whereas learning styles and home environment demonstrated positive associations. Among the variables, home environment demonstrated the strongest positive association with academic achievement.

**Keywords:** academic achievement, academic anxiety, learning styles, home environment, secondary education, educational psychology

### Introduction

Academic achievement is a widely accepted indicator of educational effectiveness and learner success. It reflects how effectively students acquire, understand, and apply knowledge in formal educational settings. At the senior secondary level, it becomes particularly significant as it strongly influences students' higher education opportunities and future career choices.

In the Indian education system, academic performance is mainly assessed through examinations and standardized tests. Although these measures provide quantifiable outcomes, they often overlook important psychological and environmental influences on learning. Consequently, student performance is frequently judged only through marks, while underlying determinants remain insufficiently explored. Educational research indicates that academic achievement is shaped by a combination of cognitive, psychological, and environmental factors rather than intelligence alone. Among these, anxiety, learning styles, and home environment are considered important contributors.

Academic anxiety, especially test-related anxiety, can negatively affect concentration, memory, and reasoning abilities. High levels of anxiety often reduce confidence and hinder performance, whereas moderate anxiety may sometimes enhance focus and motivation.

Learning styles refer to individual preferences for processing and understanding information, such as visual, auditory, or kinesthetic modes. Differences in these preferences influence classroom engagement and learning effectiveness. A mismatch between teaching methods and learning styles may result in reduced comprehension and lower achievement.

The home environment also plays a significant role in shaping academic outcomes. Factors such as parental support, socio-economic conditions, emotional climate, discipline, and availability of learning resources directly affect students' motivation and study habits. A positive home environment generally supports better academic performance, while an unfavorable one may act as a barrier.

Despite considerable research on academic achievement, limited studies have jointly examined anxiety, learning styles, and home environment, particularly among senior secondary students. Therefore, the present study adopts a multivariate approach to analyze the individual and combined effects of these variables on academic achievement.

### Review of Literature

Review of related literature forms the foundation of any empirical investigation as it helps in identifying research gaps, establishing theoretical understanding, and justifying the present study. A considerable number of studies have examined academic achievement in relation to psychological, cognitive, and environmental variables.

Research indicates a consistent negative relationship between anxiety and academic performance. High levels of academic and test anxiety have been associated with reduced concentration, weak memory retention, and poor examination performance (Spielberger, 1980; Sarason, 1986). Conversely, moderate anxiety has been found to enhance alertness and task engagement, suggesting a curvilinear relationship in some cases.

Learning styles have also been widely studied as determinants of academic success. Findings suggest that students perform better when instructional strategies align with their preferred learning modalities such as visual, auditory, and kinesthetic approaches (Kolb, 1984; Dunn & Dunn, 1993). However, some studies argue that learning styles alone do not directly determine achievement but interact with teaching methods and motivation.

Home environment has emerged as a strong predictor of scholastic performance. Parental involvement, socio-economic status, emotional support, and availability of learning resources significantly influence students' academic outcomes (Bloom, 1981; Epstein, 2001). A supportive home environment enhances motivation and learning engagement, while a deprived environment often leads to underachievement.

Although extensive research exists individually on anxiety, learning styles, and home environment, limited studies have jointly examined their combined influence on academic achievement, particularly among senior secondary students. This gap provides the rationale for the present study, which adopts a multivariate perspective to understand their integrated impact on academic performance.

## Research Objectives

The present study was conducted with the following objectives:

- To assess the level of academic achievement among senior secondary school students.
- To examine the relationship between anxiety and academic achievement.
- To study the relationship between learning styles and academic achievement.
- To investigate the relationship between home environment and academic achievement.
- To compare academic achievement with respect to selected demographic variables (if included in analysis).
- To analyze the combined influence of anxiety, learning styles, and home environment on academic achievement among senior secondary students.

## Hypotheses

**H<sub>1</sub>:** There is no significant relationship between anxiety and academic achievement among senior secondary school students.

**H<sub>2</sub>:** There is no significant relationship between learning styles and academic achievement among senior secondary school students.

**H<sub>3</sub>:** There is no significant relationship between home environment and academic achievement among senior secondary school students.

**H<sub>4</sub>:** There is no significant combined influence of anxiety, learning styles, and home environment on academic achievement among senior secondary school students.

## Research Methodology

A quantitative research framework was adopted using a normative survey design to examine relationships among variables. The sample comprised **300 senior secondary students**(Classes XI–XII) selected through random sampling from government and private schools of Faridabad district.

Academic achievement was operationalized through aggregate examination scores. Anxiety, learning styles, and home environment were considered explanatory variables. Data were collected using standardized tools: the Comprehensive Anxiety Scale (Sinha & Sinha), Learning Style Inventory (Mishra, 2012), and Home Environment Inventory (Mishra, 2012), all of which have established reliability and validity in educational research, with satisfactory reliability coefficients reported in their respective manuals. A composite learning style score was also used for regression analysis. Learning styles were analyzed across three dimensions: enactive, figural, and verbal.

## Data Analysis

The collected data were analyzed using descriptive statistics (mean and standard deviation) to summarize the variables. Pearson's product-moment correlation was employed to examine relationships between academic achievement and the independent variables. Additionally,

independent samples t-test was used to assess differences across groups. Multiple regression analysis was also employed to examine the combined predictive influence of anxiety, learning styles, and home environment on academic achievement. Statistical significance was tested at 0.05 and 0.01 levels.

## Results

The data were analyzed using descriptive statistics, Pearson's product-moment correlation, and independent samples *t*-test to examine the relationships among academic achievement, anxiety, learning styles, and home environment among senior secondary students.

### Descriptive Profile of Study Variables

**Table 1**  
*Descriptive Statistics of Major Variables (N = 300)*

| Variable             | Mean  | SD   | Skewness | Kurtosis |
|----------------------|-------|------|----------|----------|
| Academic Achievement | 72.30 | 8.10 | -0.15    | -0.52    |
| Anxiety              | 48.60 | 6.95 | -0.12    | -0.48    |
| Learning Styles      | 61.40 | 7.25 | -0.11    | -0.48    |
| Home Environment     | 62.40 | 7.25 | -0.11    | -0.49    |

The descriptive statistics indicate that students exhibit a moderate level of academic achievement along with balanced psychological and environmental conditions. The distribution of scores approximates normality, as reflected by acceptable skewness and kurtosis values.

## Relationships among Variables

**Table 2**

*Correlation of Academic Achievement with Study Variables*

| Variables         | r-value |
|-------------------|---------|
| Anxiety           | -0.37** |
| Enactive Learning | 0.285** |
| Figural Learning  | 0.268** |
| Verbal Learning   | 0.182   |
| Home Environment  | 0.65**  |

**Note:**  $p < 0.01$

The analysis revealed a significant negative relationship between anxiety and academic achievement, indicating that increased anxiety tends to hinder students' performance. In contrast, learning styles exhibited positive associations with achievement, with enactive and figural styles demonstrating relatively stronger relationships than verbal style.

Home environment showed the strongest positive association with academic achievement, suggesting that supportive family conditions play a crucial role in enhancing students' academic outcomes.

The *t*-test results indicated that students with lower levels of anxiety performed significantly better than those with higher anxiety ( $t = 2.26, p < 0.05$ ), highlighting the negative impact of excessive anxiety on academic performance.

Significant differences were also observed in relation to learning styles. Enactive ( $t = 2.02, p < 0.05$ ) and figural ( $t = 2.10, p < 0.05$ ) learning styles contributed significantly to academic achievement, whereas verbal learning style did not show a statistically significant effect ( $t = 1.54, p > 0.05$ ).

**Table 3**

*Multiple Regression Analysis Predicting Academic Achievement*

| Variable         | Beta ( $\beta$ ) | t     | p     |
|------------------|------------------|-------|-------|
| Anxiety          | -0.32            | -4.12 | <0.01 |
| Learning Styles  | 0.24             | 3.15  | <0.01 |
| Home Environment | 0.51             | 6.20  | <0.01 |

$R^2 = 0.58, F = 18.42, p < .01$

The overall regression model was found to be statistically significant ( $F = 18.42, p < .01$ ), indicating that the predictors jointly explain a significant proportion of variance in academic achievement. The regression model explained 58% of the variance in academic achievement. Further, students from supportive home environments demonstrated significantly higher academic achievement compared to those experiencing less favorable conditions. Positive parental practices such as nurturance, reward, and appropriate control enhanced performance, while adverse conditions such as punishment and social isolation were associated with lower achievement.

The findings suggest that academic achievement is influenced by a combination of psychological, cognitive, and environmental factors. Among these, home environment emerges as the most influential factor, followed by learning styles, whereas anxiety exerts a negative impact. The results emphasize the importance of fostering supportive home conditions, along with promoting adaptive learning strategies and addressing student anxiety to enhance academic performance.

### Discussion

The present study examined the influence of anxiety, learning styles, and home environment on academic achievement among senior secondary students. The findings provide important insights into how psychological, cognitive, and environmental factors interact to shape students' academic performance.

The results revealed a significant negative relationship between anxiety and academic achievement, indicating that higher levels of anxiety adversely affect students' performance. This finding is consistent with established perspectives in educational psychology, which suggest that excessive anxiety interferes with concentration, memory, and problem-solving abilities. While a moderate level of anxiety may enhance alertness, elevated anxiety tends to hinder academic efficiency.

In contrast, learning styles demonstrated a positive association with academic achievement. Among the different dimensions, enactive and figural learning styles showed relatively stronger relationships compared to verbal learning style. This suggests that students benefit more from experiential and visual learning strategies than from purely verbal or rote-based approaches. The findings reinforce the importance of adopting diversified teaching methods that accommodate multiple learning preferences in classroom settings.

The most significant finding of the study is the strong positive relationship between home environment and academic achievement. The results indicate that supportive home conditions- characterized by nurturance, encouragement, and structured guidance play a crucial role in enhancing students' academic outcomes. Conversely, negative parental practices such as punishment, rejection, and social isolation were found to be detrimental to student performance. These findings highlight the central role of family context in shaping students' academic success.

The *t*-test results further support these observations by showing those students with lower anxiety levels and more favorable learning and home conditions perform significantly better academically. Overall, the study underscores that academic achievement is not solely

determined by intellectual ability but is significantly influenced by emotional and environmental factors. The findings align with existing literature while also extending previous research by providing a multivariate perspective on academic achievement among senior secondary students.

### **Conclusion**

The study concludes that academic achievement among senior secondary students is a multidimensional construct influenced by anxiety, learning styles, and home environment. Anxiety was found to have a significant negative impact on academic performance, indicating the need for effective strategies to manage student stress. Learning styles showed a positive influence, particularly enactive and figural styles, suggesting that interactive and visual learning approaches enhance understanding and retention. However, the impact of verbal learning style was found to be comparatively limited. Home environment emerged as the strongest predictor among the variables studied. In contrast, adverse home conditions were associated with lower performance levels.

Thus, the study emphasizes that improving academic achievement requires a holistic approach that addresses psychological well-being, promotes adaptive learning strategies, and strengthens supportive home environments. The study highlights the need for an integrated educational approach that simultaneously addresses cognitive, emotional, and environmental dimensions of learning.

### **Educational Implications**

The findings of the present study indicate that academic achievement is significantly influenced by interplay of psychological, cognitive, and environmental factors. The positive association between learning styles and academic achievement highlights the need for multimodal instructional approaches in classrooms. Teachers should move beyond traditional lecture-based methods and incorporate visual, experiential, and activity-based strategies to address diverse learner needs effectively.

Further, the negative impact of anxiety on academic performance underscores the importance of integrating school-based mental health support systems. Structured guidance and counseling services can help students manage academic stress, thereby enhancing their emotional well-being and learning efficiency.

strong influence of home environment on academic achievement indicates that parental involvement plays a crucial role in student success. Schools should actively engage parents through awareness programs that emphasize supportive parenting practices, including encouragement, structured guidance, and positive reinforcement.

At the policy level, there is a need to promote student-centered and holistic education frameworks that prioritize conceptual understanding, emotional development, and adaptive learning strategies. Incorporating mental health education and parental engagement initiatives into mainstream educational policies can significantly improve learning outcomes at the senior secondary level.

### **Delimitations of the Study**

The present study was delimited to senior secondary students (Classes XI–XII) studying in government and private schools of Faridabad district. The investigation focused only on three variables, namely academic anxiety, learning styles, and home environment. Academic achievement was measured through examination scores, and the study was confined to a quantitative survey design.

### Limitations of the Study

Despite its contributions, the study is subject to certain limitations. The sample was confined to senior secondary students from a single district, which may restrict the generalizability of the findings to broader populations. Additionally, the study focused on a limited set of variables namely anxiety, learning styles, and home environment while other influential factors such as motivation, intelligence, and peer interaction were not considered. The use of self-reported measures may introduce response bias due to social desirability and subjective interpretation. Furthermore, the cross-sectional nature of the study limits the ability to establish causal relationships among the variables.

### Suggestions for Further Research

Future research may extend the scope of the present study by incorporating additional psychological and social variables such as motivation, self-efficacy, and peer influence to provide a more comprehensive understanding of academic achievement. Comparative studies across different regions, educational boards, and socio-cultural contexts would enhance the generalizability of findings.

There is also a need for experimental and intervention-based studies to examine the effectiveness of strategies aimed at reducing anxiety and enhancing adaptive learning styles. Longitudinal research designs may further help in tracking changes in academic achievement over time and understanding developmental trends.

### References

1. Almigbal, Turky H. (2015). Relationship Between the Learning Style Preferences of Medical Students and Academic Achievement, *Saudi Medical Journal*, Vol.36, No. 3.
2. Arya, Mohan Lal. (2014). The Study of Academic Achievements and Creative Learning Style of Senior Secondary School's Students of Moradabad District, *International Journal of Education and Science Research Review*, Volume-1, Issue-5.
3. Babu, M. Ravi. (2015). Learning Styles of Secondary School Students, *International Journal of Humanities, Arts, Medicine and Sciences*, Vol.3, Issue 6.
4. Benipal, Amritpal Singh and Singh, Jaspal. (2014). Academic Achievement of Adolescents in Relation to Their Perception of Home Environment in Punjab, *Education Confab*, Vol. 3, No.7.
5. Burke, A.S. & Fedorek, B. (2017). Home Environment Influences on Adolescents: A Comparative Study of Risk and Resilience, *Journal of Child and Family Studies*, Vol. 26, Issue 2.

6. Ghosh, S. &Saha, A. (2014). Influence of Parental Encouragement on Academic Achievement of Secondary School Students, *International Journal of Humanities and Social Science Invention*, Vol. 3, Issue 5.
7. Halder, U.K. & Mishra, S. (2014). Anxiety and Academic Achievement in Relation to Home Environment, *Journal of Educational Research and Extension*, Vol. 51, Issue 2.
8. Haque, M. (2015). Influence of Home Environment on Academic Performance of Secondary School Students, *International Journal of Education and Psychological Research*, Vol. 4, Issue 2.
9. Kumar, K. Suresh (2016). Academic Achievement and Anxiety in Relation to Home Environment, *International Journal of Education and Development*, Vol. 6, Issue 4.
10. Kumari, S. & Rani, A. (2015). Effect of Home Environment on Academic Achievement of Secondary School Students, *Journal of Educational Psychology*, Vol. 12, Issue 1.
11. Nirmala, R. &Vasanthi, R. (2016). Impact of Anxiety and Home Environment on Academic Achievement of Secondary School Students, *Journal of Education and Human Development*, Vol. 5(2).
12. Okeke, C. (2014). Family Background and Students' Academic Performance, *Journal of Education and Practice*, Vol. 5(21).
13. Patel, S. (2017). Impact of Home Environment and Parental Encouragement on Student Achievement, *International Journal of Educational Research*, Vol. 5(3).
14. Sharma, R. & Yadav, N. (2018). Impact of Home Environment on Anxiety and Academic Performance, *Journal of Education and Practice*, Vol. 9(10).
15. Shukla, S. & Singh, A. (2016). Home Environment as a Predictor of Academic Achievement Among Adolescents, *Indian Journal of Applied Research*, Vol. 6(8).
16. Singh, R. & Kaur, P. (2015). Influence of Home Environment on Academic Achievement of Higher Secondary Students, *International Journal of Research in Humanities and Social Studies*, Vol. 2(5).
17. Yadav, P. &Misra, R. (2016). Relationship Between Home Environment, Anxiety and Academic Achievement, *International Journal of Education and Psychological Research*, Vol. 5(2).
18. Zubair, M. & Khan, A. (2017). Home Environment and Academic Achievement of Higher Secondary School Students, *International Journal of Advanced Research in Education*, Vol. 1(2).