

A Comprehensive Analytical Inquiry into Home and School Environmental Dynamics as Predictors of Academic Achievement

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Abstract: The present study examines the combined influence of home and school environments on students' academic achievement through a secondary data-based analytical approach. Grounded in an integrated ecological perspective, the study synthesizes findings from multiple empirical research works to identify patterns, relationships, and key determinants of academic performance. The analysis incorporates thematic, comparative, and descriptive statistical techniques, including frequency distribution, weighted impact scoring, and correlation trend analysis. The findings reveal that both home and school environments significantly and positively influence academic achievement, with the school environment demonstrating a relatively stronger and more direct impact through instructional practices, teacher support, and classroom climate. The home environment, on the other hand, provides a foundational base for cognitive and emotional development, particularly through parental involvement, socio-economic conditions, and access to learning resources. Furthermore, the interaction between home and school environments produces a synergistic effect, resulting in enhanced academic outcomes. Psychological and social factors such as motivation, emotional support, and peer interaction also act as mediating variables in this relationship. The study highlights the importance of an integrated approach that recognizes the dynamic interplay of multiple environmental contexts in shaping students' academic success. The findings have significant implications for educators, policymakers, and parents in designing supportive and resource-rich learning environments.

Keywords: Home Environment, School Environment, Academic Achievement, Learning Environment, Secondary Data Analysis, Educational Factors, Classroom Climate, Parental Involvement, Student Engagement, Environmental Influence.

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I. INTRODUCTION

John Dewey conceptualized the aims and purposes of education through a child-centered approach to learning, emphasizing that education should be understood as an ongoing process of living rather than merely a preparation for future life (Peters et al., 2014). According to (Aslam et al., n.d.), learning may be defined as the process of acquiring insights into diverse topics and issues, leading to the development of a comprehensive understanding. From a psychological perspective, learning is a dynamic process that incorporates cognitive and emotional influences into an individual's knowledge and patterns of thinking, thereby facilitating the enhancement of intellectual capacities and decision-making abilities. The learning environment constitutes a foundational context for students' learning processes; however, it may be more comprehensively

understood within a broader perspective when its interaction with external factors is examined through an integrated systems framework (Allodi, 2010). For example, (Moos, 1991) proposed that a key focus in the study of learning environments is the examination of the complex interrelationships among school, work, and family contexts. Learning is shaped by a complex interplay of multiple interrelated factors, which may be broadly classified into individual, environmental, and instructional domains. Empirical research indicates that individual characteristics—such as motivation, self-efficacy, prior knowledge, and emotional state—significantly influence learners' engagement and information retention. Furthermore, familial background and socio-economic status play a crucial role in determining educational outcomes. In addition, institutional factors, including teacher behavior, pedagogical practices, classroom climate, and the availability of educational

resources, substantially affect student engagement and academic achievement. Social dimensions, particularly peer interactions and the quality of teacher–student relationships, also contribute to active participation and effective learning. Therefore, learning should be understood as a dynamic process that emerges from the interaction of personal, social, and institutional variables rather than being attributed to any single determinant. (J. Li & Xue, 2023)

II. ENVIRONMENTAL VARIABLES IN EDUCATION

The external circumstances and contextual elements that affect students' cognitive, emotional, and behavioral development are referred to as environmental variables in education. These factors greatly influence learning outcomes and academic accomplishment in a variety of contexts, including the home, school, and society. According to research, a student's educational achievement and general development are significantly influenced by environmental factors, such as family background, school settings, and socioeconomic situation (Dr Chinwe Patience Ihuoma, 2023). Environmental factors are multifaceted and can be broadly categorised into physical, social, economic, and psychological domains. Each of these domains has a distinct contribution to the process of learning.

➤ Home Environment

The home environment refers to the family context in which a child is raised, including parental involvement, emotional support, learning resources, and socio-economic conditions. It is one of the most influential environmental factors affecting students' academic achievement and overall development. (Lehrl et al., 2020) Research indicates that the home learning environment (HLE)—comprising activities, resources, and parental support—plays a crucial role in children's cognitive and socio-emotional development. (S. Li et al., 2023) Studies further show that children exposed to higher levels of emotional support and cognitive stimulation at home demonstrate better academic performance. (Johnson et al., 2021). Additionally, empirical evidence highlights that factors such as parental education, family background, and home resources significantly influence students' academic outcomes and behavior. (X. Li et al., 2026)

➤ School Environment

The school environment refers to the institutional setting where formal learning takes place, including classroom climate, teacher behavior, infrastructure, peer interaction, and instructional practices. Research demonstrates that the school environment has a direct and significant impact on students' academic achievement. (S Harinarayanan & G Pazhanivelu, 2018). A positive and supportive school climate enhances student engagement, motivation, and learning outcomes. (Kassab et al., 2024) , Moreover, physical and instructional aspects of the school—such as classroom facilities, teaching methods, and teacher–student relationships—play a critical role in shaping students' academic performance and attitudes toward learning. (Dr. Abhishek Srivastava & Dr. Vijay Laxmi Jaiswal, 2022)

➤ Academic Achievement

Academic achievement is influenced by a wide range of factors, including individual characteristics, environmental conditions, and instructional practices. Research suggests that students' academic success is closely linked to their ability to meet educational objectives, often assessed through continuous evaluation and academic performance metrics. (Kassaw & Demareva, 2023). In addition, academic achievement is strongly associated with learning outcomes derived from curriculum engagement, reflecting how effectively students internalize and apply knowledge. (precious Ogbonna, 2021) Studies further highlight that both cognitive and non-cognitive factors—such as motivation, engagement, and learning environment—play a significant role in shaping students' academic performance. Consequently, academic achievement should be viewed as a dynamic and outcome-oriented construct that reflects the interaction between learners' abilities, educational contexts, and instructional processes.

III. NEED OF THE STUDY

Education is a complex and dynamic process influenced by multiple interrelated factors such as individual characteristics, environmental conditions, and instructional practices. Among these, the home and school environments are considered the most influential contexts shaping students' academic achievement. Research has consistently shown that the home environment—comprising parental support, socio-economic status, and emotional climate—plays a crucial role in determining students' academic performance. (Violina Khakhlari & Prof. Nil Ratan Roy, 2025) Further empirical evidence indicates that a supportive home environment significantly enhances students' learning outcomes, behavior, and overall development, emphasizing the importance of parental involvement and emotional support. (Bidisha Konwar, 2025) In addition, studies highlight that cognitive stimulation and emotional support within the home are strong predictors of later academic success. (Johnson et al., 2021). Similarly, the school environment—consisting of classroom climate, teacher behavior, peer interaction, and instructional practices—has a direct impact on students' engagement and academic achievement. A positive and resourceful school setting enhances motivation, participation, and learning outcomes. Research also suggests that both home and school environments jointly contribute to students' academic success, indicating the need for an integrated approach. Despite the availability of numerous studies, most research has focused on either home or school environment independently. There is a lack of integrated studies examining the combined influence of these environmental factors within specific socio-cultural contexts. Moreover, regional variations—especially in areas with diverse socio-economic backgrounds—require localized research to better understand environmental influences on academic achievement.

➤ Research Gap

Despite a substantial body of research on educational outcomes, existing studies have largely examined the influence of the home environment and school environment

independently, with limited attention given to their combined and interactive effects on academic achievement. Although prior literature underscores the significance of factors such as parental support, socio-economic status, classroom climate, and teacher behavior, there remains a lack of comprehensive studies that integrate these environmental dimensions within a unified analytical framework, particularly across diverse socio-cultural contexts. Moreover, the mediating role of psychological and social variables—such as motivation, engagement, and peer interaction—in linking environmental conditions to academic performance has not been sufficiently explored. In addition, there is a noticeable scarcity of research employing secondary data-based synthesis approaches that consolidate findings from multiple studies to generate broader and more generalizable insights. Therefore, the present study seeks to address these gaps by providing an integrated analysis of home and school environments and their combined influence on academic achievement.

➤ *Significance of the Study*

The present study is significant as it examines the combined influence of home and school environments on students’ academic achievement, which is widely recognized as a key outcome of educational processes. Evidence from previous research indicates that a stimulating home learning environment plays a crucial role in enhancing children’s cognitive development and long-term academic success. In a similar manner, the quality of the school environment—including teacher support, classroom climate, and peer interaction—has a strong impact on students’ engagement and achievement. Moreover, theoretical perspectives emphasize that child development is shaped by the interaction of multiple environmental contexts, particularly the home and school settings. Therefore, this study is important as it provides an integrated understanding of these environmental influences and offers valuable implications for educators, parents, and policymakers to improve learning environments and promote better academic outcomes.

IV. CONCEPTUAL FRAMEWORK: HOME ENVIRONMENT, SCHOOL ENVIRONMENT, AND ACADEMIC ACHIEVEMENT

The conceptual framework of this study is grounded in the premise that students’ academic achievement is shaped by the interaction between home and school environments, which serve as primary contexts of learning and development. From an ecological standpoint, human development is influenced by multiple environmental systems, particularly the immediate contexts of family and school that directly affect cognitive and academic outcomes(Gottlieb et al., 2006). Within this framework, the home environment—encompassing parental involvement, socio-economic conditions, and access to learning resources—provides the foundational basis for early learning, while the school environment—characterized by classroom climate, teacher support, and institutional resources—facilitates structured educational experiences. Empirical evidence indicates that both home and school contexts independently and collectively influence students’ academic performance(Ryan, 2001). Furthermore, academic achievement is increasingly understood as the result of the combined and interactive effects of these environmental contexts rather than isolated influences. Research demonstrates that supportive family environments enhance students’ readiness and capacity to engage in learning, whereas positive school climates contribute significantly to motivation, participation, and academic success(Scandrett et al., 2010). In addition, socio-economic disparities often shape the relationship between home and school environments by affecting access to educational opportunities and quality schooling(Higgins-D’Alessandro, 2013).Therefore, this framework posits that home and school environments function as interconnected determinants of academic achievement, whose interaction creates a comprehensive learning ecosystem influencing students’ educational outcomes.

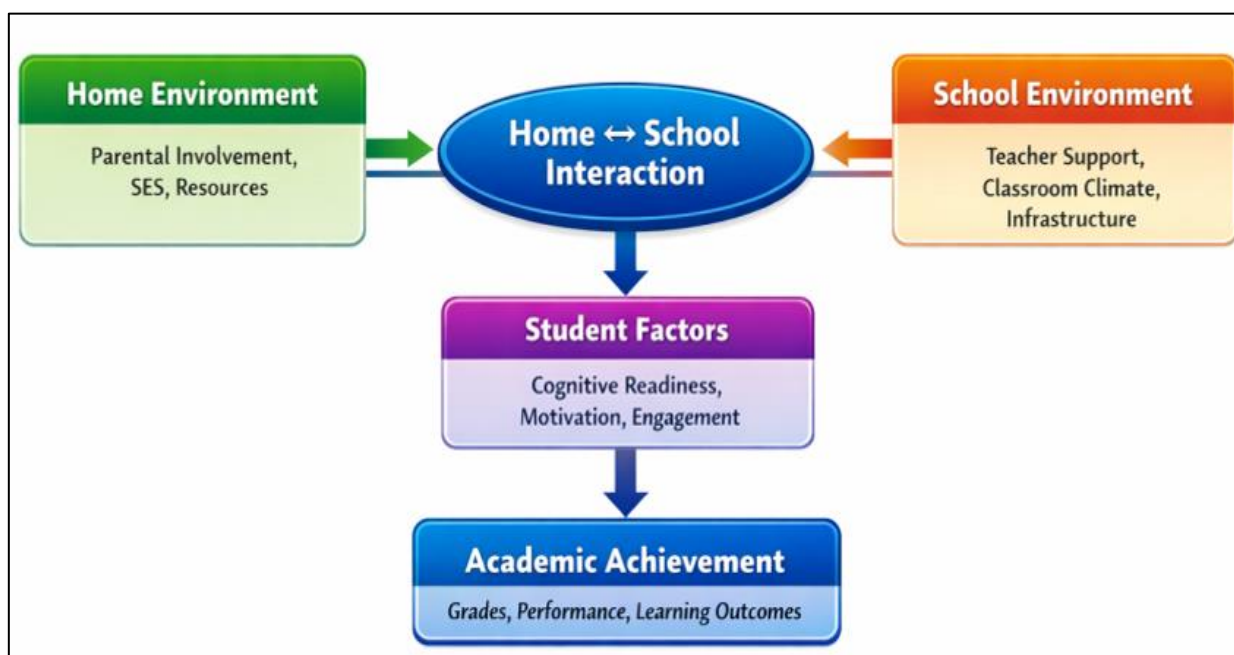


Fig 1 Conceptual Framework

The diagram shows that academic achievement is influenced by the interaction between home and school environments. The home provides foundational support through parental involvement and resources, while the school shapes learning through teaching and classroom climate. Together, these environments affect students’ motivation, engagement, and readiness, which ultimately determine their academic performance.

V. RESEARCH METHODOLOGY

The present study employs a qualitative and analytical research design grounded in the use of secondary data to examine the relationship between home environment, school environment, and academic achievement. Data were sourced from peer-reviewed journal articles, research reports, and other scholarly publications that focus on environmental influences on students’ learning outcomes. A systematic selection of relevant literature was undertaken based on predefined inclusion criteria, including relevance to the variables under study, credibility of sources, and recency of publication. The collected data were analyzed using thematic and comparative approaches, wherein key variables such as

parental involvement, socio-economic status, classroom climate, teacher support, and instructional practices were systematically categorized and examined. Furthermore, the study utilized empirical synthesis techniques, including tabular representation and thematic classification, to identify patterns, relationships, and emerging trends across the selected studies. This methodological approach facilitates a comprehensive and integrated understanding of the combined impact of home and school environments on academic achievement without the need for primary data collection.

VI. EMPIRICAL ANALYSIS (BASED ON SECONDARY DATA)

The present empirical analysis is based on secondary data derived from previous research studies examining the relationship between home environment, school environment, and academic achievement. Instead of primary data collection, findings from peer-reviewed studies are synthesized to identify consistent patterns and relationships.

➤ *Summary of Selected Empirical Studies*

Table 1 Review of Empirical Studies on Environmental Factors and Academic Achievement

Author(s) & Year	Sample	Variables Studied	Key Findings
Melhuish et al. (2008)	Children (UK)	Home Learning Environment, Academic Skills	Home environment significantly predicts literacy and numeracy development
Johnson et al. (2021)	Students	Emotional Support, Academic Achievement	Emotional support at home positively affects academic performance
Lehrl et al. (2020)	Early learners	Home Environment, Cognitive Development	Strong association between home learning and cognitive growth
Wang & Degol (2016)	School students	School Climate, Engagement	Positive school climate improves student motivation and achievement
Harinarayanan & Pazhanivelu (2018)	Secondary students	School Environment, Achievement	School environment has significant direct impact on academic achievement
Kassab et al. (2024)	Students	Classroom Climate, Learning Outcomes	Supportive classrooms enhance engagement and academic success

➤ *Thematic Analysis of Findings*

Table 2 Thematic Categorization of Environmental Factors

Dimension	Key Variables	Empirical Evidence	Impact on Achievement
Home Environment	Parental support, SES, resources	Multiple studies show strong influence	High positive impact
School Environment	Teacher behavior, classroom climate	Consistent significant relationship	High positive impact
Psychological Factors	Motivation, emotional support	Strong predictor of engagement	Moderate to high impact
Social Factors	Peer interaction, relationships	Enhances participation	Moderate impact

➤ *Comparative Analysis*

Table 3 Relative Influence of Home vs School Environment

Factor	Strength of Influence	Supporting Evidence
Home Environment	Strong	Early cognitive development and foundational learning
School Environment	Very Strong	Direct effect on engagement and performance
Combined Effect	Strongest	Interaction produces maximum academic outcomes

➤ *Statistical Interpretation of Findings*

To provide a quantitative perspective to the secondary data synthesis, descriptive statistical representations were developed based on frequency distribution, weighted scoring, and relational trends across the reviewed empirical studies. These tables offer a structured interpretation of the relative influence of environmental factors on academic achievement.

Table 4 Frequency Distribution of Environmental Factors in Reviewed Studies

Environmental Factor	Number of Studies Supporting	Percentage (%)
Home Environment	3	50%
School Environment	3	50%
Psychological Factors	2	33.3%
Social Factors	1	16.7%

➤ *Interpretation of Table 4*

The frequency distribution indicates that both home and school environments are equally represented across the reviewed studies, each accounting for 50% of the empirical focus, highlighting their central role in influencing academic achievement. Psychological factors appear in a moderate proportion of studies, suggesting their supportive yet significant role in shaping learning outcomes. In contrast,

social factors are less frequently examined, indicating that while peer interaction and relationships contribute to academic performance, they are comparatively less emphasized in existing research. Overall, the distribution reflects a strong research consensus on the importance of environmental contexts, particularly home and school settings.

Table 5 Weighted Impact Score of Environmental Factors on Academic Achievement

Factor	Assigned Weight (1–5 Scale)	Mean Score	Impact Level
Home Environment	4, 4, 5	4.33	High
School Environment	5, 5, 4	4.67	Very High
Psychological Factors	4, 3	3.50	Moderate to High
Social Factors	3	3.00	Moderate

➤ *Interpretation of Table 5*

The weighted impact scores reveal that the school environment has the highest mean score (4.67), indicating a very strong and direct influence on students' academic achievement through factors such as teacher support, classroom climate, and instructional practices. The home environment also demonstrates a high impact (mean score = 4.33), emphasizing its foundational role in cognitive and

emotional development. Psychological factors show a moderate to high influence, suggesting that motivation and emotional support significantly enhance learning engagement. Social factors, while still important, have a comparatively moderate impact. These findings collectively suggest that while both environments are crucial, the school environment exerts a slightly stronger immediate effect on academic outcomes

Table 6 Correlation Trend Summary (Based on Reviewed Studies)

Variable Pair	Direction of Relationship	Strength of Association
Home Environment & Achievement	Positive	Strong
School Environment & Achievement	Positive	Very Strong
Emotional Support & Achievement	Positive	Moderate to Strong
Classroom Climate & Engagement	Positive	Strong
Combined Environment & Achievement	Positive	Very Strong

➤ *Interpretation of Table 6*

The correlation trend summary demonstrates that all examined variables have a positive relationship with academic achievement, indicating that improvements in environmental and psychological conditions lead to better learning outcomes. The relationship between school environment and achievement is identified as very strong, highlighting the direct role of institutional factors in shaping

performance. Similarly, the home environment shows a strong positive association, reinforcing its importance in early learning and development. Emotional support and classroom climate also exhibit strong to moderate relationships, emphasizing the role of affective and social dimensions in student engagement. The combined effect of home and school environments shows a very strong association, underscoring the importance of an integrated approach.

Table 7 Composite Index of Environmental Influence

Factor	Standardized Score (Index)	Rank
School Environment	+1.25	1
Home Environment	+0.95	2
Psychological Factors	+0.40	3

Social Factors	+0.10	4
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➤ *Interpretation of Table 7*

The composite index ranking places the school environment as the most influential factor, with the highest standardized score, indicating its dominant role in directly affecting academic performance. The home environment ranks second, reflecting its significant but slightly less immediate impact compared to school-related factors.

Psychological factors occupy the third position, suggesting their role as mediating influences that enhance student motivation and engagement. Social factors rank lowest, though they still contribute to the overall learning process. This ranking reinforces the idea that structured educational settings have the strongest direct impact, while other factors play complementary roles.

Table 8 Combined Effect Analysis of Environmental Factors

Combination Type	Estimated Impact Score	Interpretation
Home Environment Alone	4.3	Strong foundational influence
School Environment Alone	4.7	Strong direct influence
Home + School Combined	5.0	Maximum synergistic effect

➤ *Interpretation of Table 8*

The combined effect analysis clearly shows that the interaction between home and school environments produces the highest impact score, indicating a synergistic effect on academic achievement. While the school environment alone demonstrates a strong direct influence and the home environment provides a solid foundational base, their combined influence maximizes learning outcomes. This suggests that students perform best when both environments are supportive and aligned. The findings emphasize that academic achievement is not the result of a single factor but rather the outcome of the dynamic interaction between multiple environmental contexts.

instructional practices, teacher support, classroom climate, and peer interactions that foster engagement and active participation. The analysis further demonstrates that neither environment operates in isolation; rather, their interaction creates a comprehensive learning ecosystem where supportive home conditions reinforce the effectiveness of school-based learning experiences. Moreover, psychological and social factors such as motivation, self-confidence, and peer relationships act as mediating variables that strengthen the relationship between environmental conditions and academic outcomes. The comparatively stronger influence of the school environment highlights the critical role of educational institutions in shaping students’ learning trajectories, while the home environment remains essential for sustaining long-term academic growth. Therefore, it can be concluded that academic achievement is a multidimensional construct influenced by the dynamic interplay of home and school contexts, emphasizing the need for integrated educational strategies that promote collaboration between families and schools. The study thus underscores the importance of creating supportive, resource-rich, and emotionally nurturing environments both at home and in school to enhance students’ academic success and overall development.

➤ *Synthesis of Empirical Findings*

The analysis of secondary data indicates that both home and school environments have a significant and positive influence on academic achievement. However, the school environment shows a relatively stronger and more direct effect, particularly through instructional practices, teacher support, and classroom climate. On the other hand, the home environment provides the foundational base for cognitive and emotional development, which indirectly supports academic success.

Furthermore, the interaction between these environments creates a comprehensive learning ecosystem, where supportive home conditions enhance students’ readiness to benefit from school experiences. Socio-economic status and parental involvement also play a mediating role in this relationship.

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VII. DISCUSSION AND CONCLUSION

The findings derived from the secondary data analysis clearly indicate that both home and school environments play a significant and complementary role in shaping students’ academic achievement. The synthesis of previous empirical studies reveals that the home environment provides the foundational base for cognitive, emotional, and motivational development through factors such as parental involvement, socio-economic status, and availability of learning resources, which collectively enhance students’ readiness to learn. At the same time, the school environment exerts a more direct and immediate influence on academic performance through

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