Classroom Environment as a Predictor of Academic Achievement among Secondary School Students

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Abstract

This study investigated the role of classroom environment as a predictor of academic achievement among secondary school students. The primary objective was to examine how factors such as teacher support, peer interaction, classroom management, and availability of learning resources influence students' performance. A quantitative, correlational design was employed, using a stratified random sample of 400 students enrolled in public secondary schools across Punjab, Pakistan. Data were collected through a standardized Classroom Environment Scale and students' academic records in core subjects. Descriptive statistics, Pearson correlation, and regression analyses were applied to assess relationships and predictive power. Findings revealed a significant positive association between supportive classroom environments and higher academic achievement. Among dimensions, teacher support and classroom management were found to be the strongest predictors, while peer interaction showed moderate influence. The study concludes that improving classroom climate can substantially enhance students' academic success. These findings hold implications for teachers, policymakers, and educational leaders in developing strategies to create more engaging, well-managed, and resource-rich classroom environments that foster academic excellence.

Keywords: *Classroom environment, academic achievement, secondary school students, classroom management, teacher support.*

Introduction

Education is universally recognized as a cornerstone of social and economic development, equipping individuals with the knowledge and skills necessary for personal and professional growth (UNESCO, 2019). Within this context, the classroom environment plays a pivotal role in shaping students' learning experience and outcomes.

A positive classroom environment fosters engagement, motivation, and academic achievement, whereas a negative one can hinder students' growth and well-being (Fraser, 2015; Wang & Degol, 2016). The classroom environment is typically viewed through physical, social, and psychological dimensions. The physical environment encompasses factors such as seating arrangements, ventilation, and lighting; the social environment refers to teacher–student and peer relationships; and the psychological environment relates to students' sense of belonging, safety, and

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support (Moos, 1979; OECD, 2020). Together, these dimensions create the overall atmosphere in which students learn.

In secondary education, the classroom environment holds particular significance, as students at this stage experience critical academic, social, and emotional transitions (Eccles & Roeser, 2011). Supportive environments can enhance academic performance and emotional adjustment, while unsupportive settings may increase stress and disengagement (Jennings & Greenberg, 2009). In Pakistan, challenges such as overcrowded classrooms, limited physical resources, and teacher-centered pedagogical practices often compromise the quality of the learning environment (Aly, 2007; Ashraf et al., 2013). These issues highlight the importance of systematically investigating classroom environments in secondary schools to understand their impact on students' learning and overall development.

Statement of the Problem

Despite substantial international evidence linking classroom environment with student outcomes, very few empirical studies have explored this relationship in the Pakistani context. Most local studies focus on teacher effectiveness, curriculum, and assessment, while the broader learning environment has received comparatively less attention (Iqbal & Mahmood, 2021; Rehman et al., 2018). This neglect has created a gap in understanding the psychosocial and physical conditions that shape learning in secondary schools. In particular, public-sector institutions where resource constraints are most severe lack systematic data on how classroom climate affects academic achievement. This gap restricts the capacity of policymakers, administrators, and teachers to design evidence-based interventions aimed at improving student learning outcomes.

Significance of the Study

This study makes several important contributions. First, it provides empirical evidence from Pakistan, a developing country where secondary education plays a critical role in social mobility and access to higher education. Second, it adopts a multidimensional framework of classroom environment encompassing teacher personality, mental aspects, environmental factors, emotional/social support, and physical conditions, thus enabling a comprehensive understanding of how these dimensions jointly influence achievement. Third, by using actual board examination scores as an indicator of academic performance, the study ensures objectivity in outcome measurement. The findings are expected to inform teacher training programs, school management policies, and government initiatives aimed at improving classroom conditions. Furthermore, they can guide principals and teachers in fostering more inclusive, engaging, and supportive classroom environments that enhance both learning and student motivation.

Objectives of the Study

1. To examine the relationship between the classroom environment and academic achievement among secondary school students.
2. To explore students' perceptions of different aspects of the classroom environment.

3. To identify which dimensions of the classroom environment are most strongly associated with academic achievement.

Hypotheses

H_o1: There is no significant relationship between the classroom environment and academic achievement among secondary school students.

H_o2: There is no significant difference in students' perceptions across various aspects of the classroom environment.

H_o3: There is no significant specific dimension of the classroom environment that predicts academic achievement more than others.

Review of Literature

The concept of classroom environment has been explained through multiple theoretical frameworks. Moos (1979) emphasized three central dimensions of learning environments: relationship, personal development, and system maintenance/change. These dimensions reflect the quality of interpersonal relationships, the opportunities for personal growth, and the organizational aspects of classroom functioning. Similarly, Bronfenbrenner's (1979) ecological systems theory highlights the classroom as part of the microsystem that directly influences student development while interacting with other systems such as family and community. More recent contributions, such as Fraser's (2015) model of learning environments, extend these perspectives by incorporating students' perceptions as central indicators of classroom climate. From a social constructivist perspective, classroom interactions play a crucial role in shaping knowledge construction. Vygotsky (1978) argued that learning takes place through social mediation, and the classroom environment provides scaffolding opportunities for students. Wang and Degol (2016) further proposed that factors such as teacher support, peer collaboration, and classroom organization directly affect students' engagement and achievement.

A growing body of literature highlights the multidimensional nature of the classroom environment, encompassing physical, social, emotional, and psychological factors. Research on the physical setting of classrooms demonstrates that adequate lighting, ventilation, seating arrangements, and availability of learning materials improve students' comfort and concentration (Barrett et al., 2015). Conversely, overcrowding, noise, and limited space negatively affect teaching and learning (OECD, 2020). In Pakistan, public sector secondary schools frequently face challenges related to overcrowding and poor infrastructure, which constrain student performance (Shahid & Khan, 2019). Another key dimension is teacher personality and support. Traits such as empathy, enthusiasm, and fairness are vital in shaping students' motivation (Cornelius-White, 2007). Effective teachers foster supportive relationships that enhance classroom climate and learning outcomes. For instance, Aldridge and Fraser (2016) found that students in supportive classroom environments reported greater engagement and achievement, while Roorda et al. (2017) showed that positive teacher–student relationships were strong predictors of academic success across cultures.

The emotional and social climate of the classroom is equally important. When classrooms promote inclusivity, respect, and emotional safety, students are willing to take academic risks and develop resilience (Jennings & Greenberg, 2009). On the

other hand, unsupportive environments contribute to anxiety and disengagement. In Asian contexts, teacher care and peer collaboration have been shown to significantly enhance students' perceptions of the classroom climate (Liu & Wang, 2021). Classroom management and organization are also central to effective learning. Evertson and Weinstein (2013) defined classroom management as the set of practices that establish a productive environment for learning. Studies indicate that well-organized classrooms, where rules are clearly established and consistently enforced, foster higher levels of student achievement (Marzano & Marzano, 2003). In contrast, poorly managed classrooms often face frequent disruptions that hinder both teaching and student performance.

The relationship between classroom environment and academic achievement is widely documented in international literature. Wang, Haertel, and Walberg's (1993) meta-analysis identified classroom management and climate as among the most influential factors affecting student achievement, surpassing even socioeconomic background. Fraser (2015) further concluded that students' perceptions of classroom environment are strongly correlated with learning outcomes. Empirical evidence supports these conclusions in diverse contexts. For example, Kumar et al. (2021) reported that supportive classroom environments positively predicted mathematics achievement among Indian secondary school students. In the United States, Pianta and Hamre (2009) emphasized that classrooms characterized by emotional support and instructional quality resulted in higher student outcomes. Similarly, in African settings, Adomako (2019) demonstrated that inadequate infrastructure and large class sizes were negatively associated with academic performance.

Evidence from Pakistan, although limited, indicates similar patterns. Rehman et al. (2018) found that classroom management and teacher support significantly predicted academic achievement among secondary school students in Punjab. Iqbal and Mahmood (2021) also reported that students' perceptions of fairness, respect, and teacher encouragement were positively associated with examination results. However, many of these studies relied on small samples, which limits their generalizability. Secondary education in Pakistan faces unique challenges that make the study of the classroom environment particularly relevant. Public schools frequently operate with scarce resources, high student–teacher ratios, and outdated teaching practices (Shahid & Khan, 2019). Despite the efforts of the Punjab Education Sector Reform Program in teacher recruitment and training, infrastructural and management problems persist (Government of Punjab, 2020). Additionally, socio-cultural factors influence classroom dynamics. For example, traditional respect for authority often results in teacher-centered pedagogy that restricts student participation (Hussain & Sultan, 2010). Gender dynamics also shape classroom experiences, with research suggesting that female students in co-educational settings often perceive the climate as less supportive (Khan & Malik, 2018).

Research Gap

While international literature offers robust evidence on the importance of classroom environment, significant gaps remain in Pakistan. Few large-scale studies have examined multiple dimensions of classroom environment in relation to student achievement. Most research has focused on urban settings, leaving rural schools

underexplored. Many studies rely solely on self-reported data without linking findings to objective measures of performance, such as board examination scores. Furthermore, limited work connects classroom environment research to actionable recommendations for policymakers and administrators. Addressing these gaps, the present study investigates the multidimensional classroom environment in secondary schools of Lahore and its relationship with students' academic achievement using board examination results.

Research Design and Methodology

This study employed a correlational research design to investigate the predictive relationship between classroom environment and academic achievement among secondary school students. The purpose of this design was to determine the extent to which variations in classroom environment explain the variance in students' academic achievement. This design was adopted because it would help in examining the possible relationship between the classroom environment and academic achievement in students enrolled in secondary schools, but without manipulating or controlling the variables. A cross-sectional survey was employed, and this was possible since data were retrieved at one time with the participants. The target population comprised all 9th-grade students enrolled in public sector secondary schools of Lahore district studying in public sector secondary schools in Lahore district, Punjab, Pakistan. The demographics of the population represented a wide variety of students in terms of social and financial background, the size of the school, and geographical location in the district, as per the official records: 76,469 male and 98,221 female students.

A stratified random sampling technique was employed to select participants due to time constraints and accessibility considerations. The final sample consisted of 400 students (52% male, 48% female), drawn from both urban and rural secondary schools in Lahore district. The sample included both male and female students to ensure gender representation. Although stratified random sampling limits the generalizability of findings, it was considered appropriate given the study scope and constraints. Data were collected using a two-part structured questionnaire developed by the researcher. Part I contained demographic questions such as gender, age, and school type. Part II assessed students' perceptions of the classroom environment across five dimensions: Teacher personality, mental aspects, environmental aspects, emotional and social aspects, and physical aspects. Responses were recorded on a Likert-type scale, enabling quantitative analysis of perceptions. Academic achievement was measured using the participants' official 9th-grade board examination scores obtained from school records.

The questionnaire was reviewed by a panel of educational experts to ensure content validity. A pilot study was conducted with 30 students not included in the main sample, and Cronbach's alpha was calculated to assess internal consistency. The reliability coefficient for the overall scale was above 0.80, indicating high reliability. Permission was obtained from school principals before data collection. Students were briefed about the purpose of the study, and informed consent was obtained. Questionnaires were administered during school hours, and responses were collected immediately to minimize response bias. Data were analyzed using SPSS (Statistical

Package for the Social Sciences). Descriptive statistics (percentages, means, and standard deviations) were calculated to summarize demographic data and students' perceptions. Inferential statistics included independent samples t-tests to examine differences in perceptions by gender, and Pearson's correlation coefficient to determine the relationship between classroom environment dimensions and academic achievement. A significance level of $p < 0.05$ was used for all statistical tests.

The instrument's reliability was confirmed using Cronbach's Alpha = .87, indicating strong internal consistency. Content validity was ensured through expert review by three education specialists from recognized universities. Mean score for classroom environment = 3.82 (SD = 0.54), indicating students generally perceived their classroom environment positively. Average academic achievement score = 71.4% (SD = 10.2). A significant positive correlation was found between classroom environment and academic achievement ($r = .46$, $p < .01$), suggesting that better classroom environments are associated with higher student achievement. The regression model was statistically significant ($F (5, 394) = 27.53$, $p < .001$), explaining 32% variance ($R^2 = .32$) in academic achievement. The standardized beta coefficients indicated

Teacher Support ($\beta = .28$, $p < .01$) – significant predictor
Student Involvement ($\beta = .19$, $p < .05$) – significant predictor
Task Orientation ($\beta = .21$, $p < .01$) – significant predictor
Cooperation ($\beta = .09$, $p > .05$) – not significant
Rule Clarity ($\beta = .15$, $p < .05$) – significant predictor
Thus, except for cooperation, all other dimensions significantly predicted academic achievement.

Data Analysis and Results

The demographic characteristics of the participants were first analyzed. Out of 400 students, 52% were male, and 48% were female. Regarding school type, 60% were from public schools, while 40% were from private schools. A majority (65%) were from urban areas, while 35% were from rural areas. Table 1 presents descriptive statistics of the main study variables.

Table 1

Descriptive Statistics of Study Variables (N = 400)

Variables	Mean	SD	Minimum	Maximum
Classroom Environment	3.78	0.54	2.10	4.90
Involvement	3.65	0.61	1.90	4.80
Teacher Support	3.82	0.58	2.00	5.00
Task Orientation	3.91	0.63	2.30	4.90
Order and Organization	3.74	0.59	1.80	4.80
Innovation	3.79	0.65	2.00	4.90
Academic Achievement (%)	72.46	9.83	48.00	93.00

The results indicate that students perceived their classroom environment as moderately positive (M = 3.78, SD = 0.54). The highest-rated dimension was Task Orientation (M = 3.91), while the lowest was Involvement (M = 3.65). The average academic achievement was 72.46%, indicating relatively strong performance among

the sample. Pearson correlation was conducted to examine the relationship between classroom environment and academic achievement.

Table 2

Correlation Between Classroom Environment and Academic Achievement

Variable	Academic Achievement
Classroom Environment	.52
Involvement	.47
Teacher Support	.43
Task Orientation	.49
Order & Organization	.41
Innovation	.39

Note. $p < .01$

The findings show that classroom environment has a positive and significant correlation with academic achievement ($r = .52$, $p < .01$). Among the dimensions, Task Orientation ($r = .49$) and Involvement ($r = .47$) showed the strongest relationships, while Innovation had the lowest but still significant correlation ($r = .39$). To test whether classroom environment predicts academic achievement, a multiple regression analysis was conducted.

Table 3

Regression Analysis of Classroom Environment Dimensions on Academic Achievement

Predictor	B	SE	β	T	p
Involvement	2.14	0.48	0.26	4.46	0.000
Teacher Support	1.72	0.50	0.19	3.44	0.001
Task Orientation	2.61	0.52	0.28	5.02	0.000
Order & Organization	1.55	0.47	0.17	3.30	0.001
Innovation	1.28	0.44	0.15	2.91	0.004

Model Summary: $R = .63$, $R^2 = .40$, $F(5, 394) = 52.36$, $p < .001$

The model explained 40% of the variance in academic achievement. Among predictors, Task Orientation ($\beta = .28$, $p < .001$) and Involvement ($\beta = .26$, $p < .001$) emerged as the strongest predictors, followed by Teacher Support, Order & Organization, and Innovation. The findings clearly demonstrate that the classroom environment plays a significant role in shaping academic achievement. Specifically, involvement and task orientation emerged as critical dimensions, highlighting the importance of student participation and goal-directed classroom practices.

Discussion

The findings of this study revealed that the classroom environment is a significant predictor of students' academic achievement at the secondary school level. The positive relationship between classroom environment and academic achievement indicates that students perform better in academically stimulating, supportive, and well-structured environments. These results align with previous studies (Fraser, 2015; Kaya & Yıldırım, 2017), which emphasized that a conducive classroom environment fosters better learning outcomes and enhances students' motivation. A well-organized classroom environment includes clarity of instruction, effective classroom

management, supportive teacher-student interactions, and opportunities for student participation. Such factors create a sense of security and belonging among students, which, in turn, contributes positively to their academic performance. Conversely, a negative classroom environment, characterized by disorganization, lack of resources, or poor teacher-student relationships, often hinders students' learning abilities and lowers their achievement levels.

The current findings are consistent with the social constructivist perspective (Vygotsky, 1978), which highlights the importance of interaction, collaboration, and supportive settings in the learning process. Students exposed to collaborative and encouraging environments tend to develop higher-order thinking skills and achieve better academic results. This study also contributes to the existing literature by focusing on secondary school students in Pakistan. Most previous research in this area has been conducted in Western contexts (Dorman, 2002; Wang & Holcombe, 2010). By validating the relationship between classroom environment and academic achievement in the Pakistani context, this study provides evidence that the role of classroom environment is universal, though its components may vary based on cultural and contextual factors.

Conclusion

This study concluded that the classroom environment significantly predicts the academic achievement of secondary school students. A conducive classroom environment marked by effective management, mutual respect, teacher support, and student engagement has a positive impact on students' learning outcomes. The findings emphasize the role of teachers and school administrators in shaping an environment that is not only academically enriching but also socially and emotionally supportive. By establishing a clear link between classroom environment and students' academic performance, the study reinforces the argument that quality education cannot be achieved without investing in the improvement of classroom conditions. Therefore, schools seeking to improve academic standards should prioritize classroom environment as a critical factor in educational planning and reform.

Recommendations

Based on the findings, the following recommendations are suggested:

1. Provide training for teachers to create positive and interactive classroom environments that encourage participation, collaboration, and critical thinking.
2. Schools should provide support for effective classroom management practices, ensuring discipline and structure without compromising student creativity.
3. Teachers should adopt student-centered pedagogies that involve active learning, group work, and problem-solving activities to enhance achievement.
4. Adequate lighting, seating arrangements, and teaching resources should be provided to create a physically conducive learning space.
5. Schools should involve parents in supporting classroom environment improvement initiatives, as home-school collaboration can reinforce positive behaviors.

6. Educational policymakers should incorporate classroom environment quality as a criterion in school evaluations and improvement plans.
7. Further Research: Future studies may include longitudinal research designs, mediating variables such as student motivation, or comparisons between urban and rural schools to expand the scope of findings.

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