(RESEARCH ARTICLE)

Check for updates

School environment: A predictor of academic achievement of senior secondary school students (Case Study of Block Kota, Bilaspur Chhattisgarh)

Sushil Kumar Patel *

Lecturer, Government Higher Secondary School Mitthunawagaon, Kota, Bilaspur, Chhattisgarh.

Abstract

The aim of the present study is to examine the impact of school environment on the academic achievement of senior secondary school students of Block Kota, Bilaspur Chhattisgarh. Eight senior secondary schools of Kota Block of Bilaspur Chhattisgarh were selected through stratified sampling technique. The data was collected from 640(320 male and 320 female) senior secondary school students. The data regarding academic achievement of the sampled senior school students was recorded from the grades or parentage of marks which they obtained from the annual examinations. Data related to school environment was collected by using the School Environment Inventory (SEI) scale developed by Mishra, (2002). T-test, Pearson's coefficient of correlation and regression analysis was used for data analysis. Results of this study reveal that female senior secondary school students of Kota Block were academically performing better than male students. The results show that there was a significant difference in the academic achievement of male and female senior secondary students of Kota Block of Bilaspur Chhattisgarh. The Pearson's coefficient of correlation illustrates that there is a significant correlation ($p \leq 0.05$) between school environment and academic achievement of senior secondary school students. Regression analysis reported that school environment plays a significant($p \leq 0.05$) role in the academic achievement of senior secondary school students. Overall findings of this study reveal that if school environment is favorable, then the students academically perform well. The concern authorities should focus on the school environment for improving the academic achievements of students.

Keywords: Academic Achievement; School Environment; Senior Secondary School Students; Chhattisgarh

1. Introduction

The academic achievement of a student is ultimate goal of its learning process. The academic achievement of students is affected by number of factors including personal, social, environmental, and contextual elements (Santos, 2019). When all of these factors are favorable, then the students report good academic achievements. Across different factors the school environment plays an important role in developing the career of a student. The school environment includes teachers, facilities, safety, and teaching methodologies (Esquivel-Santos, 2017; Ma et al., 2025).

School Environment School refers to the qualitative and quantitative cognitive, physical, social, and creative support provided to the students in schools within the teaching learning process (Davies, et.al., 2013). School environment includes both physical and psycho-social environment from which a student acquires education. The learning environment significantly impacts students cognitive and affective development, encompassing elements such as curriculum, teachers, teaching methods, classroom arrangement, physical facilities, peer interactions, socialization, socio-psychological aspects, socioeconomic factors, and technological resources (Shahzadi, 2020). Physical, social, economic, and mental factors taken together have an impact on the entire process of teaching and learning in the classroom (Liu, 2025). Empathy, trust, mutual commitment, and respect for others are the main aspects of the

♦Corresponding author: Sushil Kumar Patel

educational environment that have a significant influence on the interpersonal connections between teachers and students.

A healthy school should have the entire fruitful environment which will positively influence the academic achievement of students. From the result of past studies, it has been recommended that a healthy school environment should include

1.1. Efficient Physical infrastructure

This includes the building of school, playground of school, smart classrooms with favourable atmosphere, better libraries, good laboratories, efficient sanitation, proper drinking water, proper drainage facilities, proper roads, highly maintained lawns, etc.

1.2. Aesthetic atmosphere

With the physical infrastructure, it's necessary to develop the school surroundings into an aesthetic way, so that students could be pleased, joyful and happy while being in such an atmosphere.

1.3. Psycho-social climate and better culture

This includes the factors which are related to psychological resilience, social conditions, emotional attachment and better school culture.

Although the main objective of the school is to help students in achieving better academic excellence (Tang and Fisher, 2012). When a student enters in a school, he should face new opportunities related to socialization and cognitive development, which are offered differently in different school environments. The effective learning environment supports a student's full potential growth. Fostering a positive school climate increases sense of closeness, contentment, security, and loyalty of students towards their school as well as their trust on teachers (Oyetunji, 2006). The intellectual, emotional, and physical development of a student is improved by this sense of security. As a form of emotional security, intellectual security is defined as students' willingness to take intellectual risks in the classroom, such as posting comments and questions, joining groups, and their will to study tough topics. Despite of the background of family and neighborhood circumstances, students can achieve better if a school can foster a sense of safety. Thus, the model for the school environment should be maintained in such a way so that the students will be benefitted maximum for achieving highest academic achievements.

1.4. Research Questions

- Q1: Is there any relationship between school environment and academic achievements of senior secondary school students?
- Q2: Is there difference in the academic achievements of male and female senior secondary school students?
- Q3: What is the role of school environment in the academic achievement among senior school students?

Objectives

- To examine the academic achievement among the senior secondary school students on gender basis in Kota Block of Bilaspur, Chhattisgarh.
- To identify the relationship between school environment and academic achievements of senior secondary school students
- To examine the role of school environment in the academic achievements of senior secondary school students

Hypothesis

- H1: There is a significant difference in the academic achievements of male and female students.
- H2: There is a significant relationship between academic achievement and school environment of Higher Secondary School students.
- H4: School environment has significant predictors of academic achievement among Higher Secondary School students.

2. Research Methodology

The present study aims to evaluate the influence of school environment on the academic achievements of senior secondary school students. This study was conducted by adapting following tools and techniques

2.1. Research Design

A descriptive survey research design was used to examine the effect of school environment on the academic achievement of senior secondary school students of Block Kota, Bilaspur Chhattisgarh.

2.2. Population of Study

In the present study the population of study includes the senior secondary school students of Bilaspur Chhattisgarh. It is impossible to study the academic performance of entire population i.e., each and every student of higher secondary schools of Kashmir Division. Thus, Block Kota was selected for this study.

2.3. Sampling Technique and Sample Size

A sample was chosen from the whole population through stratified sampling technique. Currently the state of Chhattisgarh has 33 districts. Each district belongs different Blocks. In the present study we have selected Bilaspur District as first strata. In the second strata of sampling Block Kota was selected for the present study. From this block eight higher secondary schools were selected. Eighty (80) students from each school were selected as the sample for fulfilling the objectives of present study. Thus, a total of 640 higher secondary school students of Block Kota, Bilaspur Chhattisgarh was the sample size of present investigation.

2.4. Variables used in study

There are two types of variables viz; dependent variable and independent variable. In the present study the following variables were used;

2.4.1. Dependent variable

- Academic Achievement

2.4.2. Independent Variable

- School Environment

2.5. Data Collection

Both primary data and secondary data were used to conduct the present investigation.

2.5.1. Primary data collection

The results of the present study depend on the primary source of data. The primary data was collected through a pre-designed and pre-tested valid questionnaire (School Environment Inventory) developed by Mishra, (2002).

2.5.2. Secondary data collection

As the study is based on the descriptive survey method, the researcher needs the information of the Higher Secondary Schools, the information of schools, the information of school administration, and the information of school students. Without this information the study was impossible to be conducted. This information was collected from different secondary sources like; Government Websites, Offices of Education Departments, School administration etc. of Block Kota, Bilaspur District of Chhattisgarh.

2.6. Tools Used in Data Collection

Selecting reliable tools for data collection is an essential step that comes after the selection of sample. Depending on the needs of the study one or more academic measurement tools can be used depending on the new or unidentified data required for the investigation. In the present study two factors viz academic achievement and school environment are needed to be measures. The standard tools which were used to measure the academic achievement, and school environment of higher secondary school students are given below;

2.6.1. School Environment Inventory (SEI) developed by Mishra, (2002).

The School Environment Inventory (SEI) belongs 70 items. These 70 items are distributed into six dimensions viz; Creative Stimulation (CRS), Cognitive Encouragement (COE), Permissiveness (PER), Acceptance (ACC), Rejection (REJ), and Control (CON) respectively. The Creative Stimulation (CRS) dimension of SEI includes 20 items, while the remaining five dimension of SEI includes 10 items each. The student needs to answer the item by mentioning any of the five options

(always, often, sometimes, rarely and never) given against the specific item. It has been reported that there is no time limitation for this tool.

The academic achievement of the higher school students was recorded from the grades or parentage of marks which they obtained from the annual examinations. The grades or percentage of the marks was used as the indicator of academic performance

2.7. Data Analysis

The obtained data was subjected to the descriptive analysis, correlation analysis and predictive analysis. Student's t-test was used to determine the significance between two means. Pearson's coefficient of correlation was calculated to determine the relationship between dependent and independent variables. Finally, regression analysis was to determine how significantly academic achievement could be predicted by psychological resilience. All these tests were conducted by using SPSS software.

3. Results and Analysis

3.1. Academic Achievements of Students

The scores obtained for academic achievement of Higher Secondary School Students was classified into different class intervals. The number of students falling in different class intervals on the basis of their scores is presented in Table-1. It can be noted that out of total sample group (640) maximum students were falling in Grade-B2 (156), followed by Grade-B1(139), Grade-A2(117), Grade-C1(85), Grade-A1(74), Grade-C2(43), and Grade-D (26) respectively. From Table-4.1 it was observed that out of total sample group, 75.94% of Higher Secondary School Students obtain a score of more than 61%, while remaining 24.06% Higher Secondary School Students obtain a score of between 33%-60%. Based on the results the frequency distribution is fairly normal. Based on the frequency distribution pattern the normalizing transformation was not felt necessary.

Table 1 The frequency distribution of scores of Academic Achievements of Higher Secondary School Students of Block Kota, Bilaspur Chhattisgarh (N=640)

S.NO	Class Interval	Grade	Pre-Test Frequency
01	91 to 100	*A1*	74
02	81 to 90	*A2*	117
03	71 to 80	*B1*	139
04	61 to 70	*B2*	156
05	51 to 60	*C1*	85
06	41 to 50	*C2*	43
07	33 to 40	*D*	26
Sum			640

3.2. Academic Achievement across Male and Female Students

Table-2 shows t-ratios for the difference between mean academic achievement score across male and female Higher Secondary School Students. The results of the table depicts that t-ratio for the difference in the mean scores for the variable of academic achievement among male and female higher secondary students was reported to be 2.3108, which was recorded to be significant at 0.05 level of confidence. This result postulates that the male and female higher secondary school students didn't have equal mean scores on the variable of academic achievement. The mean score on the variable of academic achievement for male was 68.53 and for female it was 73.28 respectively. Here we observe that the mean scores of academic achievements for female higher secondary school students was higher than the male students, this clearly indicates that the female higher secondary school students have higher academic achievement than the male students. While observing the overall academic performance of the higher secondary school students from past few years on the basis annual examination results it was revealed that the female students dominate the male students. The t-value obtained was 2.3108 (p=0.021), which was significant at p≤0.05 level of significance. This indicates that there is a significant difference in the academic achievement of male and female senior secondary students of Kota

Block, Bilaspur Chhattisgarh. Under such circumstances the Null Hypothesis H0: "There is no significant difference in the academic achievements of male and female students" is rejected/invalid and alternate hypothesis H1: "There is a significant difference in the academic achievements of male and female students" is accepted/validated.

Table 2 t-ratios for the difference between mean academic achievement score across male and female Higher Secondary School Students (N=640)

Variable	Male HSSS	Female HSSS	t-value	p-value
Academic Achievement	Mean = 68.53 SD = 26.73 N = 320	Mean = 73.28 SD = 25.25 N = 320	2.3108	0.021*

3.3. School Environment

The descriptive statistics for the variable of different dimensions of school environment among Higher Secondary Schools of Block Kota, Bilaspur Chhattisgarh is presented in Table-3. It can be observed from the table that the average mean and median of the variable school environment among Higher Secondary Schools of Block Kota, Bilaspur Chhattisgarh was 46.67 and 40.67 respectively. The results obtained for the mean and median depicts that both these values remain in a close proximity to each other. The average values obtained for the kurtosis and skewness of the variable school environment among Higher Secondary Schools of Block Kota; Bilaspur Chhattisgarh was -0.16 and -0.15 respectively. The obtained values for kurtosis and skewness confirm that the frequency score of different dimensions for school environment are concentrated at the middle-class intervals. While considering the separate values of descriptive statistics for different dimensions of school environment variable among different higher secondary schools, it was noted that the mean and mode represent a similar trend as the overall trend of average mean and median. The Creative Stimulation (CRS) Cognitive Encouragement (COE), and Control (CON) dimensions of school environment report a negative kurtosis, while the Permissiveness (PER), Acceptance (ACC), and Rejection (REJ) dimensions report a positive kurtosis. Likewise, except Control (CON) dimension of school environment variable all the dimensions of school environment report a negative skewness.

Table 3 Mean, Standard Deviation, Sample Variance, Kurtosis, and Skewness of different dimensions of School Environment in Higher Secondary Schools of Block Kota, Bilaspur Chhattisgarh (N=640)

Dimension	Mean	Median	SD	Kurtosis	Skewness
1. Creative Stimulation (CRS)	64.18	58.50	35.75	-0.435	-0.260
2. Cognitive Encouragement (COE)	46.52	32.00	26.715	-0.810	-0.510
3. Permissiveness (PER)	52.21	26.00	37.255	0.100	-0.325
4. Acceptance (ACC)	24.06	28.00	36.535	0.045	-0.035
5. Rejection (REJ)	46.50	29.50	27.715	0.195	-0.190
6. Control (CON)	46.52	30.00	17.010	-0.075	0.435
Average Values	46.67	40.67	30.16	-0.16	-0.15

3.4. Relationship Analysis (School Environment and Academic Achievement)

The relationship between academic achievement and different dimensions of school environment of Higher Secondary School Students was explained through Pearson's coefficient of correlation, and the results are presented in Table-4. The results for the coefficient of correlation between academic achievement and total school environment was recorded to be 0.39950, which was declared to be significant (p=0.0001) at 0.01 level of confidence. Thus, we can depict that there exists a significant relationship between the academic achievement and school environment of higher secondary schools. Hence the null hypothesis H0: "There is no significant relationship between academic achievement and school environment of Higher Secondary School students" stands rejected/invalid, and simultaneously the alternate hypothesis H2: "There is a significant relationship between academic achievement and school environment of Higher Secondary School students" stands accepted/validated.

Table 4 The coefficient of correlation between academic achievement and different dimensions of school environment of Higher Secondary School Students (N=640)

Dimension of School Environment	N	r	p-value
1. Creative Stimulation (CRS)	640	0.2732	0.1667NS
2. Cognitive Encouragement (COE)	640	0.3106	0.0113*
3. Permissiveness (PER)	640	0.3771	0.0206*
4. Acceptance (ACC)	640	0.5269	0.0309*
5. Rejection (REJ)	640	-0.3992	0.1035NS
6. Control (CON)	640	-0.4778	0.2026NS
7. Total School Environment	N= 640	r = 0.39550	p= 0.0001
NS = Not significant correlation * Significant correlation at 0.05 level of confidence			

3.5. Predictive Analysis (School Environment vs Academic Achievements)

The regression analysis was worked out for the prediction of academic achievement on the basis of different dimensions of school environment among Higher Secondary School students and the results are presented in Table-5. The Model-I of Table-4 depicts values of R (0.4230) and R2 (0.3447) for variable total school environment. The value of R2 (0.39550) explains that 34.47% of the academic achievement is negatively predicted (based on its level of significance) by school environment. The remaining 65.57% of the academic achievement is predicted by the variables which aren't included in the study. The values of different regression coefficients for school environment are presented in Table-5. To determine the significance of these coefficients t-ratio was calculated. The t-ratio (t=3.1160) determines significant (p=0.0019) impact of regression coefficients for variable school environment on the academic achievements of Higher Secondary School students at 0.01 level of confidence. The F-value for school environment is 257.36, which is insignificant (p=0.0497) at different level of confidence. In this matter the null hypothesis H0: "School environment isn't a significant predictor of academic achievement among Higher Secondary School students" stands rejected/invalidated. Simultaneously the alternate hypothesis H3: "School environment has significant predictors of academic achievement among Higher Secondary School students" is accepted/validated. Thus, we can conclude that the value of R2 (0.3447) for school environment explains a significant (p=0.0019) predication in academic achievement among Higher Secondary School students.

Table 5 Regression Equation of Academic Achievement on School Environment of Higher Secondary School Students (N=640)

Variable	DF	R²	R	F	Sig
MODEL-I					
1. Creative Stimulation (CRS)	639	0.2732	0.3221	229.61	0.0526NS
2. Cognitive Encouragement (COE)	639	0.3106	0.3901	315.41	0.0449*
3. Permissiveness (PER)	639	0.3771	0.3890	434.19	0.0383*
4. Acceptance (ACC)	639	0.5269	0.5319	416.001	0.0391*
5. Rejection (REJ)	639	-0.3992	0.4118	217.33	0.0541NS
6. Control (CON)	639	-0.4778	0.4931	254.84	0.0499*
7. Total School Environment	639	0.3447	0.4230	257.36	0.0497*

NS = Not significant correlation * Significant correlation at 0.05 level of confidence

4. Conclusion

The study aims to investigate the role of school environment in the academic achievements of senior secondary school students of Kota Block of Bilaspur Chhattisgarh. The results reveal that the female students in Kota Block of Bilaspur Chhattisgarh perform academically better than male students. Findings f this study declares school environment a significant predictor ($p \leq 0.05$) of academic achievements of senior secondary school students of Kota Block of Bilaspur Chhattisgarh. The results indicate that the school environment is a multifaceted construct encompassing physical, social, emotional, and pedagogical dimensions, exerts a profound influence on students' academic achievements, warranting thorough investigation. This environment is not merely a backdrop but an active agent shaping students learning trajectories, psychosocial development, and overall well-being. Thus, the policy makers and administrators should focus developing a school environment in such a way so that it can positively affect the academic achievement of students. More studies related to the association between school environment and academic success, at both the individual and school levels, is required for investigation.

Compliance with ethical standards

Disclosure of conflict of interest

Author don't have any conflict of Interest regarding the publication of this manuscript

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

Plagiarism and AI Content

The author declares that Plagiarism of the manuscript is below 10% similarity level, and 0% AI content detected.

References

[1] Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P., and Howe, A. (2013). Creative learning environments in education—A systematic literature review. Thinking skills and creativity, 8, 80-91.

[2] Esquivel-Santos, M. G. (2017). Business Administration Students' Evaluation of Their Learning Environment. International Journal of English Literature and Social Sciences, 2(6), 185. https://doi.org/10.22161/ijels.2.6.28

[3] Liu, J. (2025). The Effects of Early Childhood Education on Long-Term Cognitive and Social Outcomes. In SHS Web of Conferences (Vol. 213, p. 02026). EDP Sciences.

[4] Ma, S., Jia, N., Wei, X., and Zhang, W. (2025). Constructing a predictive model of negative academic emotions in high school students based on machine learning methods. Scientific Reports, 15(1). https://doi.org/10.1038/s41598-025-04146-6

[5] Oyetunji, C. O. (2006). The relationship between leadership style and school climate in Botswana secondary schools (Doctoral dissertation, University of South Africa).

[6] Santos, I. B. de los. (2019). School Climate and Public Secondary School Performance In the Division of Iloilo City and Passi City. Journal of Physics Conference Series, 1254(1), 12027. https://doi.org/10.1088/1742-6596/1254/1/012027

[7] Shahzadi, U. (2020). DREEM Inventory: Investigating Learning Environment of Pre-Service Teacher Education Programs. Pakistan Social Sciences Review, 4(1), 345. https://doi.org/10.35484/pssr.2020(4-i)27

[8] Tang, J. J., and Fisher, P. A. (2012). High achieving students and their experience of the pursuit of academic excellence.