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RESEARCH PAPER

Beyond the Classroom: Mapping the Terrain of High School Achievement through Student-Teacher Interactions, Socioeconomic Realities, and School Facilities

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ABSTRACT

In the complex terrain of high school education, it is critical to comprehend the elements that greatly influence academic achievement. This study evaluated the impact of student-teacher interaction, socioeconomic status, and facilities at school on the academic achievement of high school students. The cross-sectional and quantitative research design was employed. Multistage and proportionate sampling techniques were used. 280 respondents were selected using these techniques from public sector high schools in Faisalabad. Data were collected using a questionnaire having the key study variables. The collected data was analysed with IBM SPSS for windows (27 edition). Descriptive, correlational, and multiple regression analyses were utilised to evaluate the impact of student-teacher interaction, socioeconomic status, and facilities at school on the academic achievement of high school students. The findings of the study show that student-teacher interaction, socioeconomic status, and facilities at school significantly positively impact academic achievement. The study underscores the importance of positive interaction between students and teachers, socioeconomic parity, and school infrastructure in optimizing academic achievement. Policy recommendations for educational leaders, policymakers, and administrators are also discussed.

KEYWORDS	Academic Achievement, Facilities at School, High School Students, Socioeconomic Status, Student-Teacher Interaction

Introduction

High school student's academic achievement is a complicated and multidimensional outcome that is influenced by several interconnected variables (Ahmad, Thapamagar, Ghulam, Yingli, & Yi; Kuiken & Vedder, 2021; Leksuwankun, Dangprapai, & Wangsaturaka, 2023). Socioeconomic status (SES), school facilities, and student-teacher interaction stand out as critical factors that influence academic achievement among other potential variables. It has long been known that socioeconomic status is a strong predictor of academic achievement (Zhao, Liu, & Li, 2023). SES includes factors like parental education, family income, occupation of parents, and other assets the family possess. Concurrently, the calibre of school facilities is essential to fostering a supportive learning atmosphere (Figueroa, Lim, & Lee, 2016). School facilities may be in various forms that include but are not limited to physical layout, availability of technology, laboratories, libraries, classrooms, and infrastructural facilities. Beyond these structural components, important factors that greatly influence academic achievements are student-teacher interaction, students' perceptions, attitudes,

involvement, and general contentment with their teachers (Johnston, Wildy, & Shand, 2022).

A thick body of research has been done on high school student's academic performance (Cheng, Armatas, & Wang, 2020; Kleemola & Hyytinen, 2019; Kleemola, Hyytinen, & Toom, 2023; Li, Cai, Zhong, & Liu, 2021). However, there is still a significant research gap when it comes to a thorough analysis of how socioeconomic status (SES), school facilities, and student-teacher interaction collectively impact the academic achievement of higher school students. Although some studies have examined each component separately (Korpershoek, Canrinus, Fokkens-Bruinsma, & de Boer, 2020; Poon, 2020; Xie, Vongkulluksn, Lu, & Cheng, 2020). Few have evaluated how these factors work together to affect academic achievement as a whole. The complex linkages and possible collective impact of SES, the availability of school facilities, and student-teacher interaction are frequently not well understood in the literature. Closing these gaps will help us gain a more comprehensive knowledge of the collective impact and will help us design focused interventions that specifically address the difficulties that high school students confront in various educational and socioeconomic circumstances. Thus, this study proposes to examine the impact of SES, school facilities and student-teacher interaction on the academic achievement of high school students of public sector schools located in Faisalabad.

This study makes several contributions to the existing body of literature on the factors affecting the academic achievement of higher school students. Firstly, reducing the disparity in educational opportunities requires addressing the influence of socioeconomic status on academic performance. Knowing how economic differences affect students' performance can help develop focused strategies to close the gap. Secondly, examining the impact of school facilities enables the best use of instructional resources. Determining which facilities have the biggest impact on students' academic performance helps with infrastructure development and money allocation. Thirdly, examining how students perceive their teachers provides insight into the variables that affect motivation and engagement. This knowledge is essential for developing a supportive learning atmosphere, giving students a feeling of community, and encouraging intrinsic drive in them. Fourthly, a holistic approach that takes into account the interactions between socioeconomic status, school facilities, and student viewpoints offers a thorough understanding of the variables affecting academic success. With this knowledge, strategies can be more focused and successful. Finally, Educational research is advanced by adding to the body of knowledge in this field. To adjust educational practices and policies as the context of education changes, it is imperative to be aware of different factors that affect the academic achievement of high school students.

Literature Review

Education fairness and better learning experiences require an understanding of the complex factors that influence high school students' academic achievement. This review of the literature critically looks at the research that has been done on the impact of socioeconomic status (SES), school facilities, and student-teacher interaction on academic achievement.

The impact of Socioeconomic Status (SES) on the academic achievement of high school students reflects the complex interplay between social, economic, and educational factors (Skvarc et al., 2021). A strong correlation between socioeconomic status and academic success has been found in numerous studies (Altavilla, Elosua, & Solano-Flores, 2023; Borgen, Markussen, & Raaum; Gullo & Ammar, 2022; Tan). Students'

educational trajectories are greatly influenced by family income, parental education, and access to educational resources. Research conducted by Zhao et al. (2023) supports the constant connection between differences in academic achievement and SES. While students from lower SES families experience more difficulties, those from higher SES backgrounds typically perform better academically. These inequalities are even seen in graduation rates, access to advanced placement courses, and performance on standardized tests (Alameri, Masadeh, Hamadallah, Ismail, & Fakhouri, 2020; Alla, 2019).

The term "school infrastructure" refers to a range of elements, such as physical facilities, instructional design, technological integration, and security protocols. Modern technology, well-stocked labs, libraries, and adequate classroom space are all thought to be crucial elements that can enhance students' academic experiences (Arshad, Ahmed, & Tayyab, 2019). Numerous studies have shown that greater academic achievement is correlated with well-maintained and sufficiently equipped school infrastructure (Ekundayo, 2012; Figueroa et al., 2016; Ikegbusi, Manafa, & Iheanacho, 2022). Moreover, recent research indicates that enhanced academic results can be attained through well-planned classrooms and a supportive learning atmosphere (Schlaffer & Burge, 2023). The engagement, motivation, and focus of students are influenced by a variety of factors, including lighting, seating arrangements, and the overall aesthetic attractiveness of the classroom (Ikegbusi et al., 2022). These factors ultimately affect academic attainment. Research indicates that there is a beneficial relationship between student outcomes, technology integration, and contemporary infrastructure.

The direct and indirect ways that student-teacher contact affects academic attainment have been the subject of numerous research (Núñez, Rodriguez, Tuero, Fernandez, & Cerezo, 2022; Van Der Kleij, Adie, & Practice, 2020; ZALECH & Sport, 2021). Positive interactions have been associated with higher levels of motivation, engagement, and a feeling of community among students. All these factors can lead to improved academic achievement. On the other hand, negative interactions like feeling that a teacher is unjust or unsupportive can cause disengagement and have a detrimental effect on academic results (Anane, 2020). Additionally, the way that student-teacher interactions affect academic accomplishment varies depending on the cultural and contextual situation. Cultural elements may influence the type of interactions that occur, such as communication patterns and expectations (Senar, Eryilmaz, Sandoval-Hernández, & Lapresta-Rey). Furthermore, the interactions between students and teachers can be influenced by the socioeconomic background of schools and regional educational policy (Johnston et al., 2022).

The existing literature emphasizes the need for a comprehensive understanding of the various factors influencing educational experiences, highlighting the interdependence of SES, school infrastructure, and student-teacher interaction concerning high school students' academic achievement. This comprehensive viewpoint is essential for guiding educational interventions and policies meant to promote fair and stimulating learning environments. Thus, the present study proposes theses hypotheses (1) Student-Teacher Interaction significantly positively impacts academic achievement, (2) Socioeconomic status significantly positively impacts academic achievement, (3) Facilities at school significantly positively impacts academic achievement.

Material and Methods

All ninth-grade students from public sector schools in the Faisalabad district made up the study's population. The male ninth-grade students from every public school

in Tehsil City Faisalabad were the target group. In this study, multistage sampling was employed. There are six tehsils in the district of Faisalabad. Using basic random sampling, one tehsil was chosen in the first stage. There were 40 male schools in this tehsil. The office of the District Education Officer (DEO) in Faisalabad provided a list of schools. Ten schools were chosen at random from the chosen tehsil for the second stage. In the end, students were chosen from each class using a straightforward random selection method. Students were chosen using a proportionate sampling technique. Half of the students in each class were chosen. 350 questionnaires were given to randomly selected students. A total of 280 surveys were completed. Seventy questionnaires were incomplete and contained several missing values. Consequently, these surveys were not given any thought. Finally, 280 surveys were found to be precise and thorough.

The questionnaire was comprised of two parts: The first part measures the socioeconomic and demographic characteristics of the respondents. These characteristics were the education level of the father and mother, the income of the family, Sibship size, family type, and family structure. The second part gauged SES. Facilities at schools, and student–teacher interaction. SES was measured using two subscales of housing and household assistance. They had six and twelve items respectively. Facilities at school were measured using a ten-item scale. Items for these scales were taken from the national level survey that is conducted regularly to measure individual and structural level variables to assess societal development. Pakistan Social and Living Standard Measurement Survey (PSLSMS), the Pakistan Household Integrated Survey (PHIS), and the Economic Survey of Pakistan (ESP) are regularly conducted in Pakistan. In addition to this, some socioeconomic indicators were identified by a gleaning literature review. Student-teacher interaction variable was measured using a Likert scale having five response categories from strongly agree to strongly disagree. It had 10 items. The range of Cronbach's values of all scales was from 80 to .89.Additionaly, the standardized composite score of a student's academic achievement on the ninth-grade exam is the dependent variable. Every year, the Board of Intermediate and Secondary Education (BISE) in Faisalabad conducts it. This variable has an interval level. This exam has a score range of 0 to 550.

A cross-sectional survey was employed to evaluate the research hypotheses. The research employed correlation analysis and multiple regression analysis with IBM Corp.'s SPSS software (Version 27.0; 2022). Multiple regression and correlation analysis are accepted statistical techniques in the social sciences for determining the link between intricate variables. Correlation analysis was used to assess the associations among the research variables, which included student-teacher interaction, socioeconomic status, facilities at school, and academic achievement. Multiple regression analysis was utilised to ascertain the extent to which student-teacher interaction, socioeconomic status, and facilities at school predict academic achievement after adjusting for other relevant variables. To evaluate the regression model's capacity for prediction, R square and adjusted R values were noted. Furthermore, only after establishing the dependent variable's normality was multiple regression analysis performed.

Hypotheses

H_1:Student-Teacher Interaction significantly positively impacts academic achievement.

H_2: Socioeconomic Status significantly positively impacts academic achievement.

H_3: Facilities at school significantly positively impact academic achievement.

Results and discussions

Table 1.
Sociodemographic Characteristics

Mother education			Father Education		
Categories	**f**	**%**	**Categories**	**F**	**%**
Illiterate (No Schooling)	64	22.9	Illiterate (No Schooling)	52	18.6
Primary Level	48	17.1	Primary Level (I-V)	41	14.6
Secondary Level	102	36.4	Secondary Level (VI-X)	93	32.2
Higher Level	66	23.6	Higher Level (College, University)	94	33.2
Total	280	100.0	Total	280	100.0
Monthly Household Income			**No.of sibling**		
Categorical	*f*	%	Categories	*F*	%
less than 10000	63	22.5	1-3 Siblings (Small)	83	29.6
10000--29999	79	28.2	4-7 Siblings (Medium)	164	58.6
30000-49999	55	19.6	>8 Siblings (Large)	33	11.8
50000-69999	52	18.6			
70000-89999	19	6.8			
More than 90000	12	4.3	Total	280	100.0
Total	280	100.0			

Table 1 presents the sociodemographic characteristics of the study participants, focusing on the educational levels of mothers and fathers, as well as monthly household income and the number of siblings. The educational levels of mothers and fathers are presented in separate columns. For mothers, the majority fall into the Secondary Level category (36.4%), followed by Higher Level (23.6%) and Illiterate (22.9%). For fathers, the distribution is somewhat similar, with the highest percentage in the Secondary Level category (32.2%), followed by Higher Level (33.2%) and Illiterate (18.6%). The distribution of monthly household income is depicted, with the majority falling into the 10,000-29,999 category (28.2%), followed by less than 10,000 (22.5%) and 30,000-49,999 (19.6%). The smallest percentages are observed in the 70,000-89,999 (6.8%) and more than 90,000 (4.3%) categories. The data on the number of siblings is presented, with the highest percentage in the 4-7 Siblings (Medium) category (58.6%), followed by 1-3 Siblings (Small) (29.6%) and >8 Siblings (Large) (11.8%).

Table 2 furnishes descriptive statistics for the key study variables, namely Socioeconomic Status (SES), Family Affluence Scale (FAS), Student-Teacher Interaction (STI), and Academic Achievement (ACA). The SES values exhibit a moderate spread within the sample, as indicated by the range of 0.00 to 5.00, a mean of 3.25, and a standard deviation of 1.77. The FAS scores show a broader variability, ranging from 1.00 to 17.00, with a mean of 9.30 and a standard deviation of 4.05. Student-teacher interaction (STI) scores reflect diverse experiences, ranging from 10.00 to 50.00, with a mean of 35.98 and

a standard deviation of 9.38. Academic Achievement (ACA) scores span from 142 to 512, exhibiting a mean of 330.32 and a standard deviation of 75.11. Notably, the variance values for each variable provide insights into the degree of dispersion from the mean, indicating considerable variability in SES, FAS, STI, and ACA scores within the studied sample.

Table 2
Descriptive Statistics of the Study Variables

Variables	_Range_	_Min_	_Max_	_Mean_	_Std Dev_	_Vari_
SES	5.00	.00	5.00	3.25	1.77	3.15
FAS	16.00	1.00	17.00	9.30	4.05	16.43
STI	40.00	10.00	50.00	35.98	9.38	88.06
AOC	370	142	512	330.32	75.11	5642.43

Note: STI: Student-teacher interaction; **SES:** Socioeconomic status; **FAC:** Facilities at school; **ACA:** Academic achievement

Table 3 reveals the correlational analysis among the study variables. STI is positively associated with SES (r = 0.455, p < 0.01), FAS (r = 0.341, p < 0.01), and ACA (r = 0.351, p < 0.01). SES and FAS exhibit a robust positive correlation (r = 0.614, p < 0.01). FAC positively correlates with STI (r = 0.322, p < 0.01) and SES (r = 0.455, p < 0.01). ACA is positively correlated with STI (r = 0.351, p < 0.01), SES (r = 0.455, p < 0.01), and FAC (r = 0.322, p < 0.01). The correlation coefficients in Table 3 reveal interesting relationships between the key variables studied in the research. For instance, there is a positive correlation between Student-Teacher Interaction (STI) and Socioeconomic Status (SES), indicating that as the quality of interactions between students and teachers improves, there is often a positive association with the socioeconomic status of the students. This suggests that students with better socioeconomic backgrounds tend to experience more positive interactions with their teachers. A strong positive correlation between SES and Family Affluence (FAS) indicates a robust connection. Essentially, students from wealthier families are more likely to have higher socioeconomic statuses. This finding reinforces the idea that family affluence and socioeconomic status are closely linked. Furthermore, the positive correlation between Facilities at School (FAC) and STI suggests that schools with better facilities tend to foster more positive interactions between students and teachers. This underlines the importance of school infrastructure in shaping the quality of student-teacher interaction. The positive correlations of Academic Achievement (ACA) with STI, SES, and FAC imply that higher academic achievement is associated with positive student-teacher interactions, higher socioeconomic status, and improved school facilities.

Table 3
Correlational Analysis of the Study Variables

Variables_	STI	SES	FAC	ACA
PTS	1			
SES	.455**	1		
FAS	.341**	.614**	1	
AOC	.351**	.455**	.322**	1

Note: **Correlation is significant at the 0.01 level

Note: STI: Student-teacher interaction; **SES:** Socioeconomic status; **FAC:** Facilities at school; **ACA:** Academic achievement

Essentially, students who excel academically often have positive interactions with teachers, come from higher socioeconomic backgrounds, and attend schools with better facilities.

Before running the multiple regression analysis, assumptions for this test were checked. The assumption of linearity was checked by using scatter plots of independent variables. Plots show that this assumption is met. The assumption of multicollinearity has been met as VIF scores for prior performance are well below 10, and tolerance scores are above 10. 2 (statistics =.91 and 1.1, respectively). VIF scores for the number of siblings are also well below 10, and tolerance scores are above 10. 2 (statistics =.99) and 1 statistically. Similarly, VIF scores for parental involvement are well below 10, and tolerance scores are above 10. 2 (statistics =.92 and 1, respectively). The values of residuals were independent, as the obtained value of Durbin-Watson was close to 2 (Durbin-Watson = 1.4). The plot of standardised residuals and standardised predicted values showed no obvious signs of funnelling, suggesting the assumption of homoscedasticity has been met. The P-P-Plot for the model suggested that the values of residuals are normally distributed. Cook's distance values were all under 1, suggesting individual cases were not unduly influencing the model. Table 4 displays the results of the regression analysis and hypothesis testing for the impact of Student-Teacher Interaction (STI), Socioeconomic Status (SES), and Facilities at School (FAS) on Academic Achievement (ACA).

Hypotheses Testing

H_1 evaluates whether Student-Teacher Interaction significantly positively impacts academic achievement. The results reveal that Student-Teacher Interaction significantly positively impacts academic performance TSI→ACA (B = 0.359, t = 5.296, p < .001). Hence H_1 is supported. Numerous studies highlight the importance of positive and encouraging teacher-student connections on academic achievement, including those conducted by (Johnston et al., 2022; Kincade, Cook, & Goerdt, 2020; Liu, Muthu, & Sivaparthipan, 2021; Sanders & Jordan, 2013). Higher achievement in school can be attributed to the development of student involvement and motivation through effective communication, individualized attention, and a supportive learning environment.

Table 4
Regression Analysis and Hypotheses Testing

Hypotheses	Regression weights	B	t	p-value	Results
H_1	STI→ACA	.359	5.296	.000	Approved
H_2	SES→ACA	.132	3.472	.000	Approved
H_3	FAS→ACA	.207	3.632	.000	Approved
R²	.24				
F (3, 276)	30.05				

Note: p < 0.05 **STI:** Student-teacher interaction; **SES:** Socioeconomic status; **FAC:** Facilities at school; **ACA:** Academic achievement

Academic achievements are greatly impacted by teachers who engage with their students, offer helpful criticism, and foster a supportive and welcoming environment in the classroom. The study's finding, which supports H-1, highlights how crucial it is to develop a close rapport between instructors and students to improve their academic achievement. All things considered, the empirical evidence supporting H-1 highlights the critical influence that pleasant student-teacher relationships have on determining

students' academic progress, offering insightful information for educational practices and regulations.

H_2 evaluates whether Socioeconomic Status significantly positively impacts academic achievement. The results reveal that Socioeconomic Status significantly positively impacts academic performance SES→ACA (B = 0.132, t = 3.472, p < .001). Hence H_2 is supported. Studies conducted by Altavilla et al. (2023), Zhao et al. (2023), and Skvarc et al. (2021) repeatedly show that students from wealthier households typically have access to a wider range of educational resources, extracurricular activities, and a nurturing home environment. All of these things work together to improve student achievement. Similarly, this result is also consistent with a large body of prior research that shows a favourable relationship between improved academic achievement and a higher socioeconomic level (Skvarc et al., 2021; Tan; Zhao et al., 2023). A potential explanation is that the availability of resources like extracurricular activities, tutoring, and educational materials to students from wealthier homes has a positive impact on their academic performance. Simply put, the educational opportunities and assistance that students receive are closely related to their family's socioeconomic situation, which can lead to differences in their academic achievement. The findings of the study, which corroborate H-2, advance knowledge of how socioeconomic variables influence students' educational paths.

H_3 evaluates whether Facilities at school significantly positively impact academic achievement. The results reveal that Facilities at school significantly positively impact academic performance FAS→ACA (B = 0.207, t = 3.632, p < .001). Hence H_3 is supported. This result is in line with previous research that highlights how crucial school amenities are in affecting student success (Schlaffer & Burge, 2023; Schneider, 2002; Sidi, 2019; Usen, 2016). Schools that are kept up and furnished appropriately create a favourable learning environment that enhances students' motivation, academic engagement, and general performance (Maphoso & Mahlo, 2014). Modern classrooms, libraries, labs, and leisure spaces are examples of school infrastructure investments that have been linked to enhanced learning environments and greater student results (Ikegbusi et al., 2022). Thus, the study's findings are consistent with what is commonly believed that improved academic achievement is supported by a favourable school environment and well-maintained infrastructure. In conclusion, the empirical evidence supporting H-3 highlights the critical role that school facilities play in determining youngster's achievement in school and offers insightful information to educational administrators and legislators.

Additionally, the R2 value of 0.24 implies that the model explains 24% of the variance in Academic Achievement. The F-statistic (30.05) is statistically significant (p < 0.001), suggesting that the overall model is a good fit for the data. In summary, the results affirm that Student-Teacher Interaction, Socioeconomic Status, and Facilities at school significantly impact Academic Achievement.

Conclusion

To conclude, this study highlights the critical roles that facilities at school (FAS), socioeconomic status (SES), and student-teacher interaction (TSI) play in determining the academic achievements of high school students. Fostering supportive relationships between teachers and students is important, as seen by the favourable association found between TSI and Academic Achievement. Furthermore, the verified influence of FAS and SES emphasizes the necessity of focused initiatives to eliminate socioeconomic inequality and fund school infrastructure. These results offer insightful information to educators

and legislators who are working to establish inclusive learning environments. High school students' academic performance depends on a comprehensive approach that prioritizes pleasant relationships, equitable chances, and accommodating facilities because education is at the crossroads of interpersonal dynamics, economic issues, and physical places.

Recommendations

Based on its findings, this study makes three recommendations to stakeholders, legislators, and educational practitioners to maximize academic achievement. First, it is advised to concentrate on improving teacher professional development to maximize the educational experience for high school pupils. Teachers' interpersonal and communication skills should be continuously improved through the implementation of training programmes, with a focus on fostering positive interactions between students and teachers. It has been repeatedly demonstrated that these connections have a positive impact on academic attainment. It's also critical to support positive classroom behaviours like giving constructive criticism and encouraging one-on-one attention. Teachers ought to make an effort to establish inclusive classrooms that support good student-teacher interactions and provide an environment that is favourable to academic achievement. Second, it is critical to address the socioeconomic gaps that exist among students. Educational institutions and legislators must undertake focused interventions and develop regulations that guarantee all students, regardless of their financial circumstances, fair and equal access to resources, learning materials, and opportunities. Educational stakeholders may foster an environment that supports each student's academic potential by creating parity on the playing field. Third, it is imperative to make strategic investments in the infrastructure of schools. Enough funding ought to be set out for the upkeep and improvement of schools, libraries, labs, and leisure spaces. It is important to emphasise that having a well-equipped school environment has a favourable impact on student's academic engagement and overall achievement.

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