Effect of Student Attendance on Academic Achievement: An Empirical Analysis

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ABSTRACT

Student attendance has long been considered a crucial determinant of academic success in higher education. This study examines the relationship between class attendance and academic achievement among students through an empirical analysis. The research investigates whether regular attendance significantly influences academic performance, measured through examination scores, grade point averages, and overall course outcomes. Data were collected from a sample of students across different academic programs and analyzed using descriptive statistics, correlation analysis, and regression techniques to assess the strength and direction of the relationship between attendance and achievement.

The findings reveal a positive and statistically significant association between attendance and academic performance. Students with higher attendance rates consistently achieved better academic results compared to those with irregular attendance. The analysis further indicates that attendance serves as an important predictor of academic achievement even after accounting for other influencing factors. Regular

classroom participation enhances students' understanding of course content, engagement with learning activities, and interaction with instructors and peers, thereby contributing to improved learning outcomes.

The study highlights the importance of promoting consistent attendance as a strategy for enhancing student performance and educational quality. The findings provide valuable insights for educators, academic administrators, and policymakers in designing interventions and attendance policies aimed at improving student engagement and academic success in higher education institutions.

KEYWORDS: *Student Attendance; Academic Achievement; Academic Performance; Higher Education*

Introduction

Teaching in small groups is widely considered an important component of undergraduate education in the Indian context. While lectures often involve one-way delivery where students passively receive information, smaller class settings—such as tutorials, practical sessions, or discussion groups—encourage active participation. Through solving problems, engaging in discussions, and interacting with instructors, students are able not only to assess their understanding but also to develop a deeper grasp of the subject matter.

However, there is limited empirical evidence within the Indian higher education system to firmly support this perspective. The mechanisms through which various educational inputs influence student performance at the university level remain insufficiently understood, especially when compared to school-level education. Factors such as class size, peer interaction, quality of instruction, and attendance are often assumed to play significant roles, but their combined and individual effects have not been comprehensively examined in the Indian context. This gap in empirical research is a significant limitation, particularly as higher education in India becomes increasingly competitive and expands rapidly. With growing student enrollments and resource constraints in many institutions, it is essential to better understand the determinants of effective teaching and learning. Additionally, recent policy changes and investments in higher education highlight the need to ensure that available resources are utilized efficiently to enhance learning outcomes.

This study aims to contribute to the teaching and learning quality in Indian post-graduate education by examining the impact of key classroom-related factors on student performance. Specifically, it focuses on attendance, class size, peer effects, and the role of teaching support. By analyzing these components together, the study seeks to provide a more comprehensive view of how different aspects of the educational environment influence academic outcomes.

Furthermore, this study adopts a methodological approach that allows for a more accurate interpretation of results. By using structured academic data and controlling for differences among students, it becomes possible to distinguish between genuine causal effects and simple statistical relationships. The analysis also considers variations across students and learning environments, enabling a clearer understanding of how individual characteristics and institutional factors interact to shape academic performance.

The findings indicate that differences among students—both observable and unobservable—play a crucial role in determining academic outcomes. In comparison, factors such as attendance, class size, peer influence, and teaching support tend to have a relatively smaller impact when these individual differences are taken into account. This suggests that student-specific characteristics remain a dominant factor in

explaining variations in academic performance within the Indian higher education system ***(Martins, P., & Walker, I, 2006).***

Literature Review

Stanca, L. (2006). The author provides fresh evidence regarding the impact of attendance on academic achievement. Using a large panel dataset of introductory microeconomics students, the study explicitly considers the influence of unobservable factors associated with attendance, including ability, motivation, and effort. The findings show that neither proxy variables nor instrumental variable techniques effectively eliminate omitted variable bias. Results obtained from panel estimators reveal that attendance has a smaller, yet still significant, effect on academic performance. Lectures and classes appear to influence performance in a similar manner when considered separately, although their individual effects cannot be distinguished clearly. Overall, the study concludes that even after accounting for unobservable student characteristics, attendance continues to have a statistically significant and practically meaningful impact on student learning.

Kim Et.al (2020). Although attendance is commonly assumed to have a direct and positive influence on academic success, previous research has produced inconsistent results. In addition, limited attention has been given to the possible role of student engagement, especially classroom participation, in explaining this relationship. The current study examined whether in-class participation acts as a mediator between attendance and academic achievement within the setting of a small liberal arts college in the United States. Students' scores on the final cumulative examination were used as an unbiased indicator of learning achievement.

The findings revealed a significant indirect effect of attendance on academic performance through participation, with a point estimate of .08 (SE = .02, 95% CI [.06, .12]). Furthermore, when participation was controlled for, the direct effect of attendance on academic performance became statistically insignificant (B = .03), t(.71), p = .48, indicating a strong mediating role of participation. These findings suggest that classroom participation explains much of the positive association between attendance and academic achievement reported in earlier studies.

While the results should be interpreted cautiously because the study was conducted within a specific educational environment, they provide useful implications for educators. In particular, instructors may consider structuring courses, assessment methods, and active learning strategies in ways that promote greater student participation during class.

Guleker Et.al (2014). Faculty members in higher education institutions often adopt varying attendance policies and practices. Some instructors make attendance mandatory and include it as part of the final grade, whereas others do not enforce such requirements. Nevertheless, even in situations where attendance is optional, many educators consider it beneficial for academic achievement. This article presents a review of recent studies examining the relationship between attendance and academic performance, along with a more detailed investigation of this association within the Albanian context. The data were gathered from two courses offered in the civil engineering department of a private university and taught by the same lecturer between 2009 and 2012. The findings are discussed in relation to the attendance policies currently implemented in Albanian higher education institutions.

Rodgers, J. R. (2001). Existing research suggests that absenteeism from university classes is a widespread issue in both Australia and North America. From a societal perspective, the seriousness of this issue depends on whether absenteeism negatively influences student learning outcomes. Several researchers in the field of economics have supported this view; however, none have conclusively demonstrated a causal relationship through the use of experimental data and rigorous statistical methods. The present study employed panel data collected from business and economics students enrolled in an introductory statistics

course at an Australian university to examine the impact of attendance on academic performance. By accounting for unobserved differences among students, the methodology offers an advancement over earlier cross-sectional regression studies. The findings reveal that attendance has a modest yet statistically significant influence on academic performance.

Diab-Bahman Et.al (2022). This paper seeks to explore the relationship between academic performance and attendance in an e-learning environment, moving beyond the traditional classroom context. The study examines how attendance affected the final grades of 389 first- and second-year undergraduate students who were enrolled in Business Management courses online for the first time across three consecutive semesters within one academic year. The findings revealed a negative correlation between attendance and grades. However, when the data were analyzed separately by academic year, important differences emerged in the relationship between attendance and performance for first-year and second-year students. Consequently, the study concludes that both student attendance and academic year had a statistically significant effect on grades. Although the influence of attendance on academic achievement has not been widely investigated, particularly in Management studies and within online learning settings, the topic is of growing relevance to educators and policymakers as the continued effects of the pandemic have increased the prominence of e-learning.

Dey, I. (2018). This study makes two important contributions to the existing body of research on the relationship between attendance and examination performance. First, it utilizes new longitudinal data collected from students at a large public university in the United States. Second, it explores whether the effect of attendance differs according to students' race, gender, and level of academic preparedness for the course. The findings indicate that class attendance has a positive and statistically significant impact on exam results, and this relationship remains consistent across different model specifications.

Furthermore, the study reveals that the benefits of attendance are not equally distributed among all student groups. Greater gains from attending classes were observed among male students, non-white students, those who completed prerequisite courses at another institution, students who earned lower grades in prerequisite courses, those who had taken the prerequisite course long ago, and students who initially possessed lower overall GPAs. These findings highlight the potential value of implementing policies that promote class attendance, particularly through the use of active learning strategies.

Alija, S. (2013). This study investigates student attendance at the Faculty of Business and Economics and its effect on academic achievement. The research is organized into two sections. The first section examines the causes of low attendance, including inadequate motivation, ineffective teaching approaches, and institutional-related factors. The second section focuses on the influence of attendance-related elements, such as student motivation and bonus marks, on overall academic performance.

The study relies on survey responses and academic performance data collected from students enrolled in three courses—Business Mathematics, Statistics, and Managerial Economics—across different academic years. Logistic regression analysis is employed to assess the association between attendance and academic success.

The findings reveal that, in addition to external commitments, many students are absent from classes because of dissatisfaction with teaching practices and institutional management. The results further demonstrate that attendance exerts a significant positive effect on students' final academic performance, particularly in subjects that emphasize practical application.

Caviglia-Harris, J. L. (2006). This paper explores the effect of a compulsory attendance policy and absenteeism on students' academic performance. The study utilizes data gathered from four sections of introductory microeconomics courses taught by the same instructor to estimate student achievement. The findings remain consistent even after adjusting for survival bias and endogeneity, revealing that the mandatory attendance policy itself did not significantly influence student grades. Prior GPA and SAT

scores were identified as reliable predictors of academic performance and were found to have a greater effect on grades than absenteeism rates. Based on these findings, the study recommends that instructors promote and encourage class attendance rather than enforce it compulsorily in both small and large classroom environments.

Objective of this Study

To analyze the relationship between student attendance and academic performance using statistical methods.

Specific Objectives

- To examine the correlation between attendance percentage and marks obtained by students.
- To determine whether higher attendance leads to better academic performance.
- To identify the significance of attendance as a factor influencing student outcomes.
- To apply regression analysis to measure the impact of attendance on academic scores.
- To evaluate whether attendance can be considered a reliable predictor of student success.

Study area

This study focuses on analyzing the relationship between attendance percentage and academic scores of students using class records and internal assessment data. The analysis is limited to a specific group of students and considers attendance as the primary independent variable and marks as the dependent variable. Statistical tools such as correlation and regression are used to evaluate the relationship.

The study does not account for other influencing factors such as intelligence level, socio-economic background, teaching quality, or personal circumstances, which may also affect academic performance.

Description of collated data

The sample for this study has been collected from two distinct higher education institutions in Kolkata: the Army Institute of Management, Kolkata (AIMK) and Jadavpur University (JU). The selection of these institutions was deliberate in order to capture variation in academic structures and evaluation systems.

The Army Institute of Management, Kolkata is affiliated with MAKAUT (Maulana Abul Kalam Azad University of Technology), where examination question papers are centrally set by the university. In this system, the college has no direct role in framing the question papers, ensuring a standardized and externally controlled evaluation process across affiliated institutions.

In contrast, Jadavpur University follows an internal examination system, where question papers are designed and set by the university's own faculty. This allows for greater autonomy in assessment design and may reflect institution-specific teaching methods and academic priorities.

Student id	Attendance %	Marks %
1	60	46
2	35	44
3	60	76
4	50	52
5	60	84
6	55	78
7	25	42
8	25	50
9	50	66
10	30	28

11	70	88
12	15	40
13	55	82
14	10	32
15	30	56
16	20	50
17	55	50
18	55	60
19	55	32
20	50	46
21	60	74
22	55	72
23	65	36
24	15	80
25	40	90
26	60	64
27	45	70
28	45	64
29	25	52
30	10	28
31	15	46
32	30	20
33	50	34
34	40	76
35	45	58
36	40	76
37	45	64
38	45	74
39	25	36
40	25	36
41	45	58
42	50	62
43	50	52
44	60	84
45	55	78
46	25	42
47	50	46
48	60	74
49	55	72
50	65	36

Table 1: Attendance and Academic Performance Data – Army Institute of Management, Kolkata (MAKAUT Affiliated System)

Student id	Attendance %	Marks%
1	95	92
2	80	87
3	95	91
4	75	86
5	100	90
6	100	93
7	85	83
8	85	82
9	100	90
10	100	90
11	95	83
12	85	86
13	75	75
14	85	83
15	85	80
16	95	85
17	100	85
18	65	72
19	95	95
20	60	82
21	75	86
22	100	94
23	65	80
24	100	93
25	100	91
26	100	96
27	100	95
28	100	90
29	100	87
30	95	90
31	75	75
32	100	93
33	65	84
34	95	88
35	60	76
36	100	92
37	100	92
38	95	82
39	95	81
40	80	78
41	100	91
42	60	65
43	80	81

44	100	93
45	85	91
46	80	88
47	100	90
48	95	85
49	96	85
50	98	90

By collecting data from these two institutions, the study incorporates two fundamentally different academic and evaluation frameworks, one externally regulated and standardized, and the other internally designed and administered. This dual-sample approach enhances the robustness of the analysis by allowing comparison across diverse educational settings and ensures that the findings are not limited to a single type of institutional structure.

Methodology

This study adopts a quantitative research approach to examine the relationship between student attendance and academic performance. The primary variables considered are attendance percentage as the independent variable and marks obtained as the dependent variable. Data for the study is collected from class attendance records and internal assessment scores of students within a specific group.
The collected data is first organized and prepared in a structured format before being entered into IBM SPSS Statistics for analysis. Data cleaning is performed to ensure accuracy by checking for missing values, inconsistencies, or errors. Attendance data is converted into percentage form wherever necessary to maintain uniformity.
Descriptive statistical techniques, including mean, standard deviation, and frequency distribution, are applied in SPSS to summarize the basic characteristics of the dataset. Subsequently, correlation analysis (Pearson correlation) is conducted to measure the strength and direction of the relationship between attendance and academic scores.
To further examine the impact of attendance on performance, linear regression analysis is performed using SPSS. This helps in determining how changes in attendance percentage influence students' marks and whether attendance can be considered a significant predictor of academic success. Additionally, hypothesis testing is carried out using significance values (p-values) obtained from SPSS output to determine whether the relationship between the variables is statistically significant. Two types of

Hypothesis are there:
Null Hypothesis (H_0):
There is **no significant relationship** between student attendance and academic performance.
Alternative Hypothesis (H_1):
There is **a significant relationship** between student attendance and academic performance.
In this study the confidence interval taken as 95% that is **$\alpha = 0.05$**
Finally, the results generated from SPSS are interpreted to understand the nature and extent of the relationship between attendance and academic performance. Based on these findings, conclusions are drawn regarding the influence of attendance on students' academic outcomes.

Results & Analysis
This section presents the findings of the study based on the data collected from the Army Institute of

Management, Kolkata and Jadavpur University. The analysis is carried out using IBM SPSS Statistics to examine the relationship between student attendance and academic performance.

Initially, descriptive statistics are used to summarize the key characteristics of the dataset, including the distribution of attendance percentages and marks obtained by students in both institutions. This provides a preliminary understanding of overall trends and variations within the data.

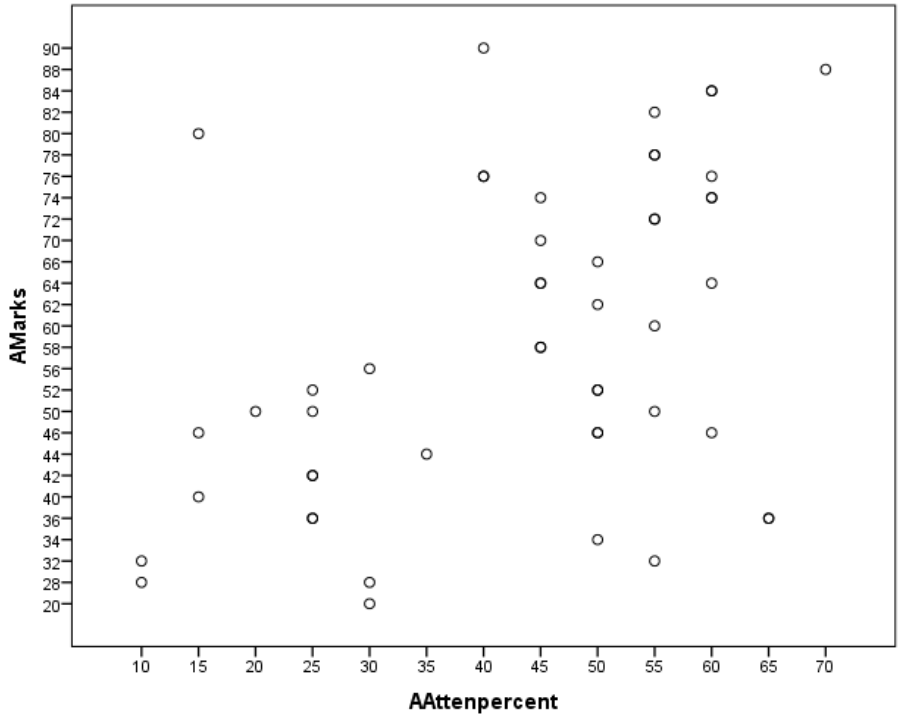
Subsequently, correlation analysis is conducted to evaluate the strength and direction of the relationship between attendance and academic scores. This is followed by regression analysis to assess the extent to which attendance influences academic performance and whether it can be considered a significant predictor of student outcomes.

Given that the data has been collected from two institutions with different evaluation systems—one externally regulated (MAKAUT-affiliated) and the other internally administered (Jadavpur University)—a comparative perspective is also incorporated in the analysis. This enables a deeper understanding of how institutional differences may affect the relationship between attendance and academic performance.

The results obtained from these statistical analyses are interpreted in detail in the following sections.

Regression Output in SPSS

Data set- AIMK Data
Sample Size = 50
Sampling Technique = Purposive sampling / Convenience sampling
Scatter Plot



Regression
Descriptive Statistics

	Mean	Std. Deviation	N
AMarks	57.12	18.398	50
AAttenpercent	43.20	16.186	50

Correlations

		AMarks	AAttenpercent
Pearson Correlation	AMarks	1.000	.455
	AAttenpercent	.455	1.000
Sig. (1-tailed)	AMarks	.	.000
	AAttenpercent	.000	.
N	AMarks	50	50
	AAttenpercent	50	50

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AAttenpercent[b]	.	Enter

a. Dependent Variable: AMarks
b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.455[a]	.207	.191	16.552	1.957

a. Predictors: (Constant), AAttenpercent
b. Dependent Variable: AMarks

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3435.132	1	3435.132	12.539	.001[b]
	Residual	13150.148	48	273.961		
	Total	16585.280	49			

a. Dependent Variable: AMarks
b. Predictors: (Constant), AAttenpercent

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	34.774	6.731		5.166	.000	21.240	48.307
	AAttenpercent	.517	.146	.455	3.541	.001	.224	.811

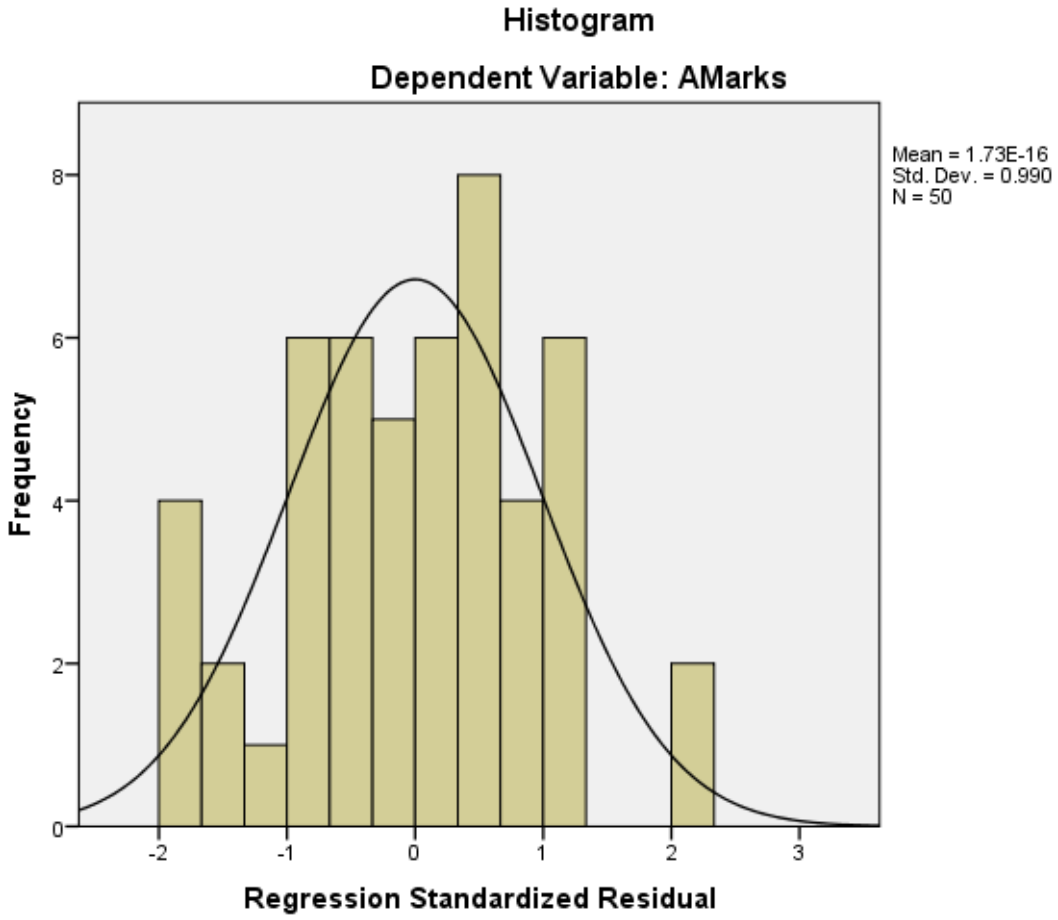
a. Dependent Variable: AMarks

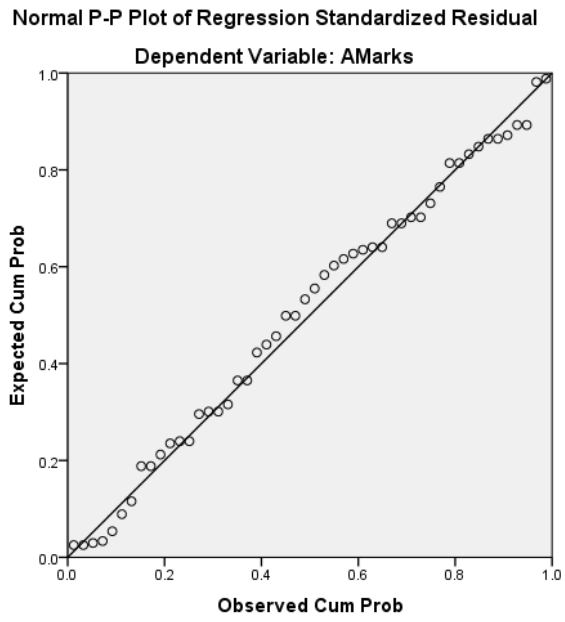
Residuals Statistics[a]

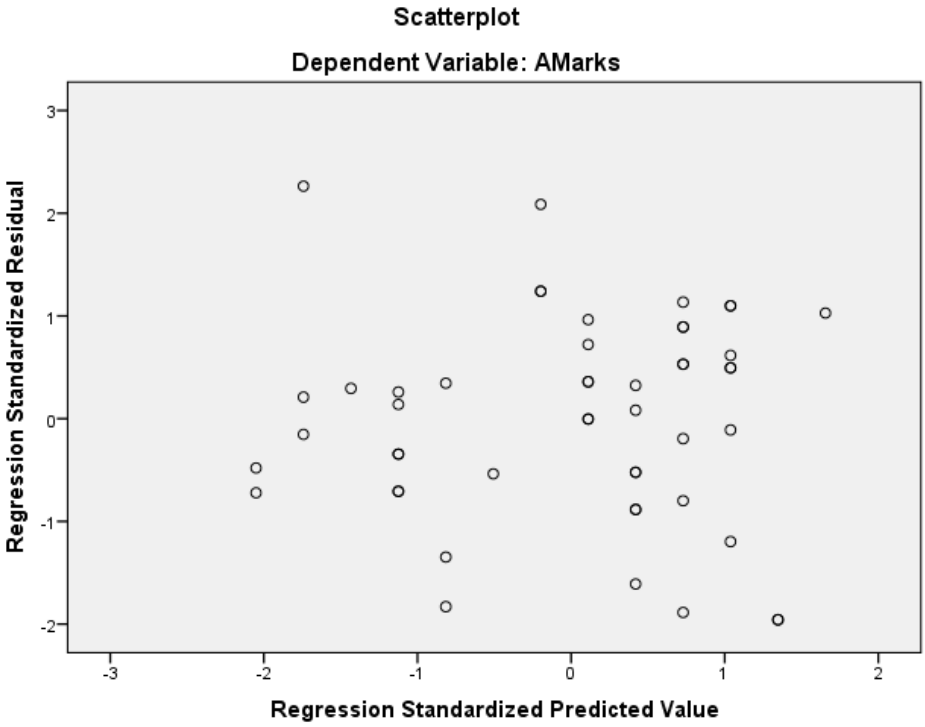
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	39.95	70.98	57.12	8.373	50
Residual	-32.397	37.467	.000	16.382	50
Std. Predicted Value	-2.051	1.656	.000	1.000	50
Std. Residual	-1.957	2.264	.000	.990	50

a. Dependent Variable: AMarks

Charts



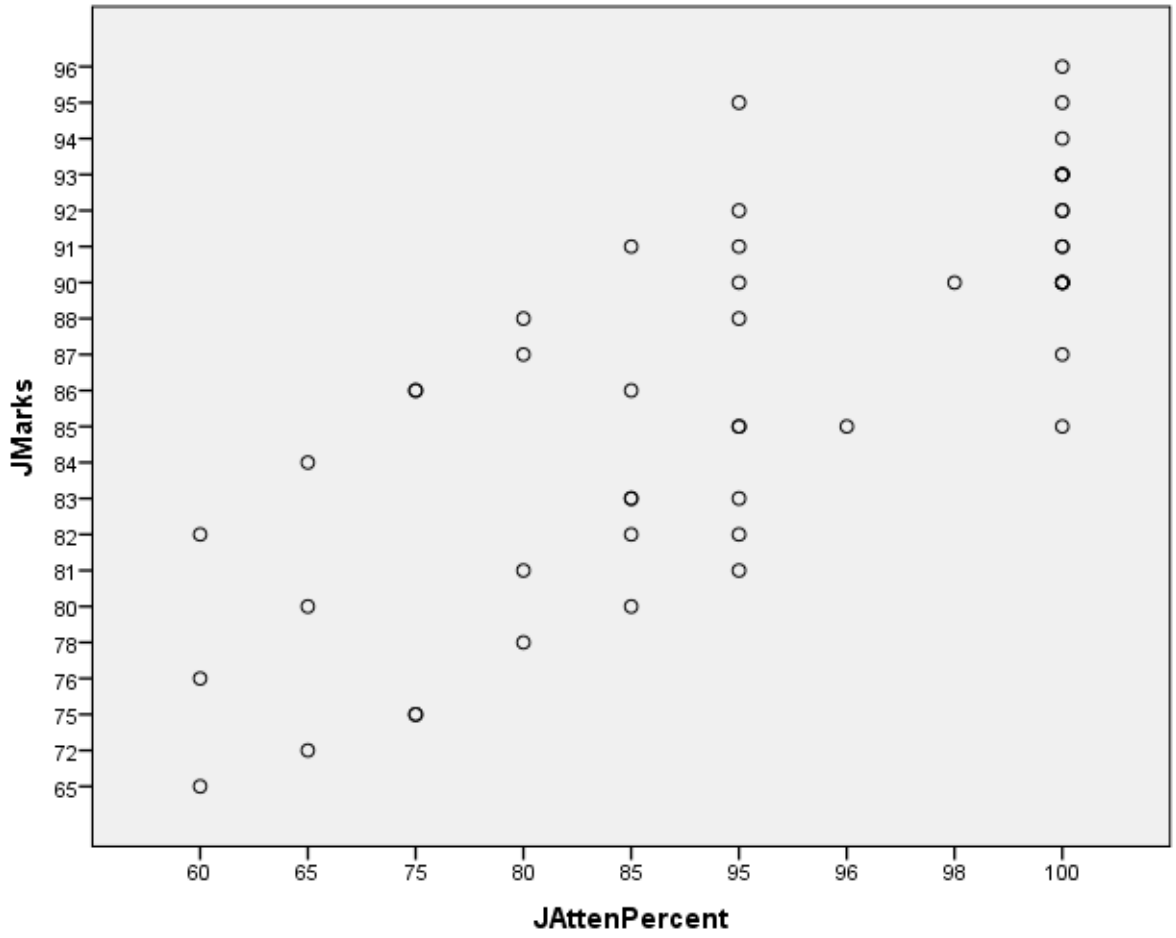




Regression Output in SPSS

Data set- JU Data
Sample Size = 50
Sampling Technique = Purposive sampling / Convenience sampling

Scatter Plot



Regression
Descriptive Statistics

	Mean	Std. Deviation	N
JMarks	86.24	6.542	50
JAttenPercent	88.98	12.875	50

Correlations

		JMarks	JAttenPercent
Pearson Correlation	JMarks	1.000	.764
	JAttenPercent	.764	1.000
Sig. (1-tailed)	JMarks	.	.000
	JAttenPercent	.000	.
N	JMarks	50	50
	JAttenPercent	50	50

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	JAttenPercent[b]	.	Enter

a. Dependent Variable: JMarks
b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.764[a]	.584	.575	4.265	1.182

a. Predictors: (Constant), JAttenPercent
b. Dependent Variable: JMarks

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1224.049	1	1224.049	67.296	.000[b]
	Residual	873.071	48	18.189		
	Total	2097.120	49			

a. Dependent Variable: JMarks
b. Predictors: (Constant), JAttenPercent

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound

1	(Constant)	51.699	4.254		12.154	.000	43.147	60.251
	JAttenPercent	.388	.047	.764	8.203	.000	.293	.483

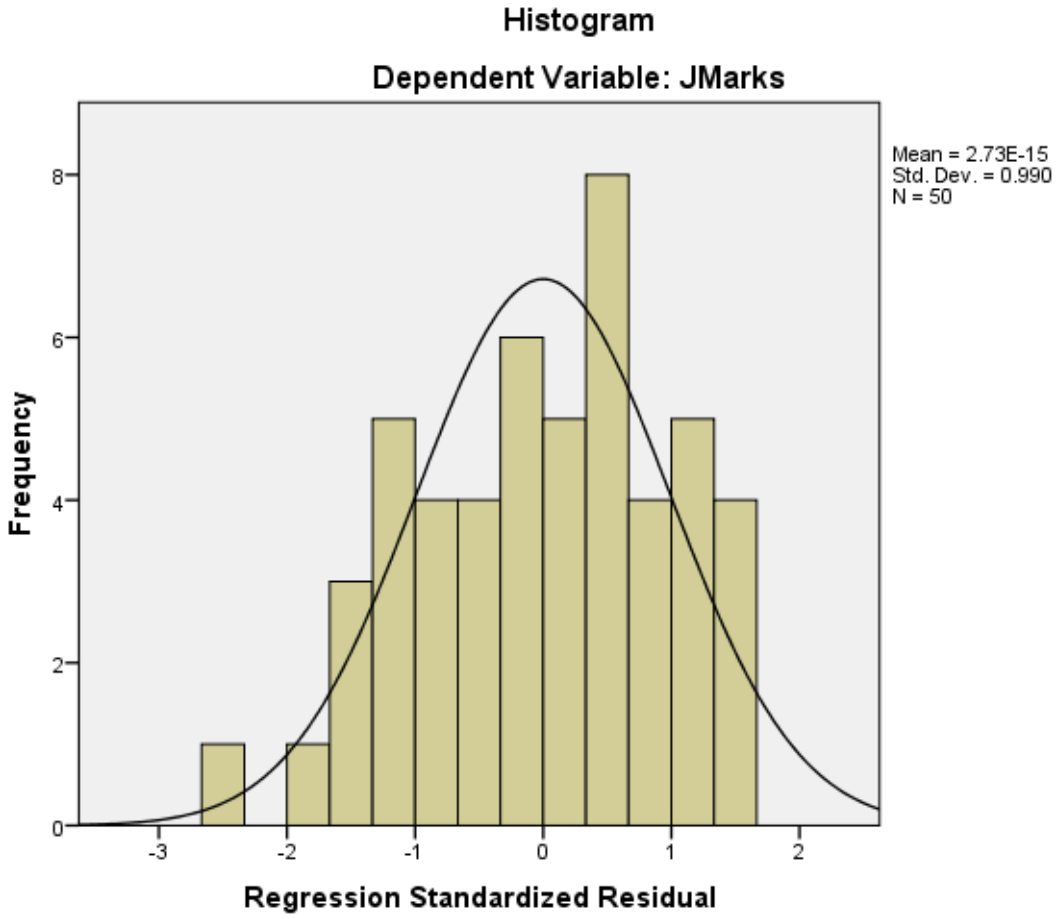
a. Dependent Variable: JMarks

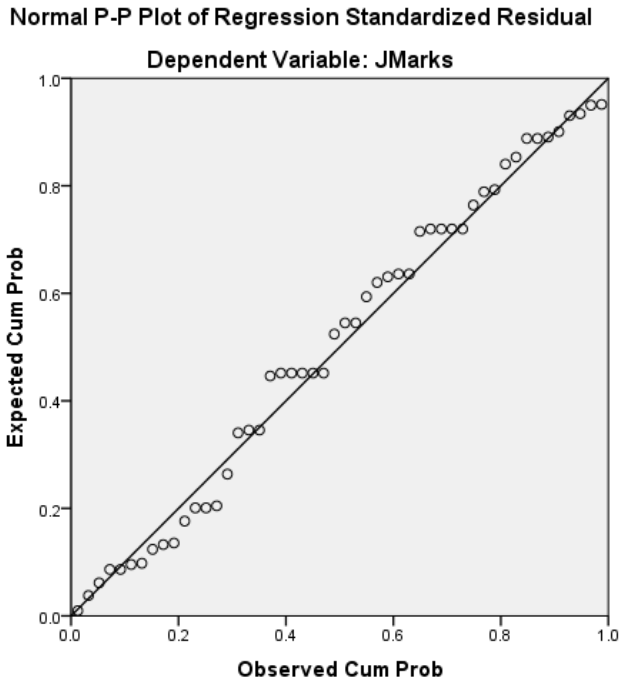
Residuals Statistics[a]

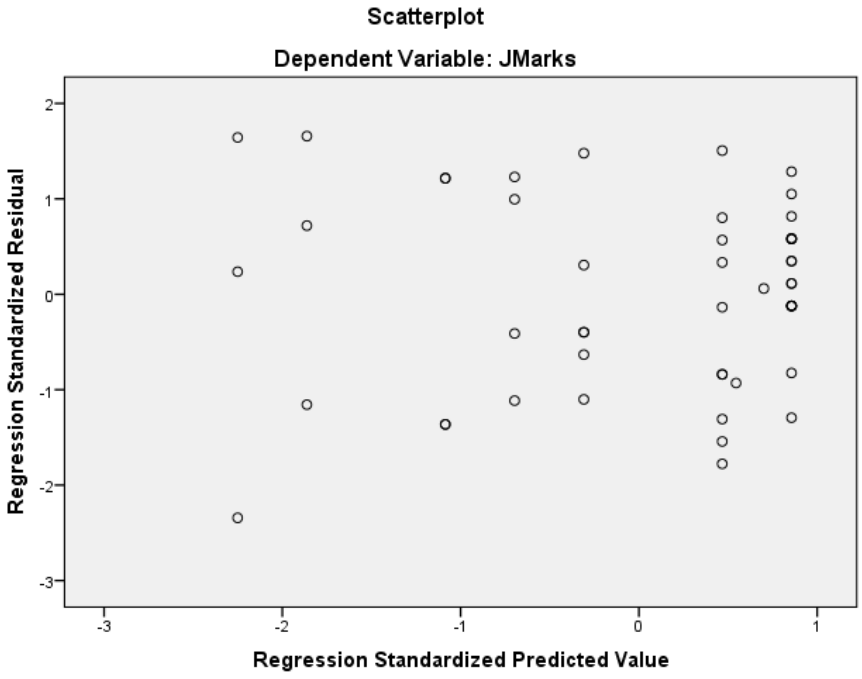
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	74.99	90.52	86.24	4.998	50
Residual	-9.990	7.069	.000	4.221	50
Std. Predicted Value	-2.251	.856	.000	1.000	50
Std. Residual	-2.342	1.657	.000	.990	50

a. Dependent Variable: JMarks

Charts




Normal P-P Plot of Regression Standardized Residual
Dependent Variable: JMarks
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: JMarks
Regression Standardized Residual
Regression Standardized Predicted Value
2
1
0
-1
-2
-3

Findings

The statistical analysis was conducted separately for the datasets collected from the Army Institute of Management, Kolkata (AIMK) and Jadavpur University (JU) using IBM SPSS Statistics.
For the AIMK dataset, the descriptive statistics indicate that the average marks obtained by students is 57.12, while the mean attendance percentage is relatively low at 43.20% . The Pearson correlation coefficient between attendance and marks is 0.455, which suggests a moderate positive relationship between the two variables. This implies that higher attendance is associated with better academic performance, although the strength of this relationship is not very strong.
The regression analysis further supports this finding. The R^2 value of 0.207 indicates that approximately 20.7% of the variation in marks can be explained by attendance alone . The regression coefficient for attendance is 0.517, meaning that a 1% increase in attendance leads to an approximate 0.52 increase in marks. The p-value (0.001) confirms that this relationship is statistically significant. However, since a large proportion of variation remains unexplained, other factors beyond attendance likely influence student performance in this case.

AIMK Data Regression Equation

The linear regression model is:

$$\hat{Y} = 34.774 + 0.517X$$

Where:

- $\hat{Y}$= Predicted Marks (AMarks)
- X= Attendance Percentage (AAttenpercent)
- **Intercept (a) = 34.774**
- **Slope (b) = 0.517**

Interpretation:

For every 1% increase in attendance, marks increase by approximately **0.517 units**.
In contrast, the JU dataset presents a notably different pattern. The average marks are significantly higher at 86.24, along with a high mean attendance of 88.98% . The correlation coefficient is 0.764, indicating a strong positive relationship between attendance and academic performance. This suggests that attendance plays a much more influential role in determining student outcomes in this institutional setting.
The regression results reinforce this observation. The R^2 value of 0.584 shows that approximately 58.4% of the variation in marks is explained by attendance , which is substantially higher than that observed in the AIMK dataset. The regression coefficient (0.388) indicates that a 1% increase in attendance results in an approximate 0.39 increase in marks, and the relationship is highly significant (p-value = 0.000).

JU Data Regression Equation

The linear regression model is:

$$\hat{Y} = 51.699 + 0.388X$$

Where:

- $\hat{Y}$= Predicted Marks (JMarks)

- *X*= Attendance Percentage (JAttenPercent)
- **Intercept (a) = 51.699**
- **Slope (b) = 0.388**

Interpretation:
For every 1% increase in attendance, marks increase by approximately **0.388 units**.

A comparative analysis of both datasets reveals that while attendance positively influences academic performance in both institutions, its impact is considerably stronger in Jadavpur University than in AIMK. This difference may be attributed to variations in evaluation systems, teaching methods, and student engagement levels. Overall, the findings suggest that attendance is an important determinant of academic success, though its degree of influence may vary across institutional contexts.

Conclusion

The present study aimed to examine the relationship between student attendance and academic performance using datasets from two distinct institutions—Army Institute of Management, Kolkata (AIMK) and Jadavpur University (JU). The analysis, conducted using correlation and regression techniques in SPSS, reveals that attendance has a positive and statistically significant impact on academic performance in both cases.

However, the strength of this relationship varies notably between the two institutions. In the case of AIMK, attendance shows a moderate influence on student performance, indicating that while it contributes to academic outcomes, other factors also play a substantial role. In contrast, the JU dataset demonstrates a strong relationship between attendance and marks, suggesting that regular class participation is a more critical determinant of academic success in this context.

The comparative findings highlight those institutional differences—such as evaluation systems, teaching methodologies, and academic environment—may influence the extent to which attendance affects performance. Overall, the study concludes that attendance is an important predictor of academic achievement, but its impact is not uniform and depends on the broader educational framework.

These results emphasize the need for educational institutions to encourage regular attendance while also considering other contributing factors to enhance student performance effectively.

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