

EXAMINING THE IMPACT OF TEACHING EFFECTIVENESS AND STUDENT ENGAGEMENT ON ACADEMIC PERFORMANCE: A QUANTITATIVE STUDY

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Abstract

This study examines the impact of teaching effectiveness and student engagement on academic performance using a quantitative research approach. The research is based on a secondary dataset comprising 1,000 student records, including variables related to teaching quality, student engagement, and academic outcomes. Teaching effectiveness is measured through indicators such as teaching clarity, helpfulness, and feedback timeliness, while student engagement is assessed using attendance, participation, assignments, and study habits. Descriptive statistics, correlation analysis, and multiple regression analysis are employed to evaluate the relationships among variables. The findings reveal that both teaching effectiveness and student engagement have significant positive effects on academic performance. Furthermore, the combined influence of these factors provides a stronger explanation of student outcomes compared to their individual effects. The results highlight the importance of integrating effective teaching practices with strategies that promote active student engagement. The study contributes to the growing body of educational research by providing empirical evidence on the interconnected role of instructional quality and student involvement in enhancing academic achievement.

Keywords: *Teaching Effectiveness, Student Engagement, Academic Performance, Classroom Practices, Quantitative Analysis.*

1. Introduction

The quality of instruction and the degree to which students are interested in the process are generally recognized as one of the key elements of academic success in classrooms. Good instruction goes beyond being content delivery and involves the intelligibility of instruction, timely and useful feedback, and the capacity to create a climate of engagement. The contemporary education systems are beginning to focus on the role of instructional quality in student achievement, especially in the structured classroom settings where performance variables can be measured in a systematic way. It has been empirically argued that positive teacher-student relationships and properly designed teaching practices have a significant positive impact on student engagement and academic performance (Mallik, 2023; Chui and Chui, 2024). With institutions still focusing on performance-based education, the importance of the quantitative analysis of these relationships has been on the rise.

Student engagement is very important in defining the effectiveness of learning and transfer of knowledge in students. It is usually described as the level of attention, interest, and engagement that students have in the learning process. Engagement can sometimes be seen in behaviors like attendance, classroom activities, assigned work, time spent on independent study. These behavioral clues give quantifiable information about the efforts and dedication of students to learn. Previous studies have repeatedly shown that increased levels of engagement are related to better academic performance, which is why an interactive and participatory learning experience is also essential (Galamay et al., 2025; Al Hussaini et al., 2024). In addition, the student engagement has been considered as an important mediating variable between teaching practices and student achievement, which means that effective teaching has an indirect impact on student performance by improving student engagement (Tomaszewski et al., 2022; Huang, 2024).

The linkage of effectiveness in teaching with student engagement is further supported by researches on innovative and student-based methods of teaching. The use of teaching methods fostering collaboration, critical thinking, and active engagement has been found to lead to the improvement of the level of engagement and learning outcomes significantly (Roza, 2025; Ammer and Alnasser, 2025). Moreover, the studies of the instructional quality address the fact that clear explanations, meaningful feedback, and consistent academic support should be offered by teachers, and, in this way, students will be more engaged and are likely to demonstrate higher performance levels (Meeran et al., 2025; Oanh & Nguyen, 2025). These results highlight that not only the quality of the teaching process but also the degree of student engagement are vital ingredients of academic achievement.

Over the last couple of years, the changing nature of the education environment has added new dimensions affecting engagement and learning outcomes. Though the current study is centered on conventional classroom-based variables, the current literature states that technology-enhanced learning environments and virtual platforms also contribute to determining the student engagement and academic performance (Ibrahim et al., 2025; Petare et al., 2023). Equally, student-centered learning models have been proven to be effective as project-based and interactive learning methods were linked to higher engagement and academic success (Zen and Ariani, 2022; Baddane and Ennam, 2024). These views can give a larger context to the interplay between teaching effectiveness and student engagement even in a situation where the discussion is limited to classroom indicators that can be measured.

Although a lot of research has been conducted in this field, the main limitation of the available literature is that the studies have focused on the effectiveness of teaching and student engagement separately, but have not investigated them as two variables that interact with one another. Although the mediating effect of engagement has been addressed in some studies, there is still a need to carry out empirical research that focuses on a number of cursors of teaching effectiveness and student engagement concurrently with the academic performance. Furthermore, the differences in the performance of students in similar learning environments imply that extra research is needed to determine how these variables can interact to affect performance. It is important to fill this gap so that one can come up with evidence-based strategies that will improve teaching practices and also the learning experience of students.

In this respect, the current research proposes to conduct a quantitative analysis of the correlation between the effectiveness of teaching, student engagement, and academic performance based on a structured dataset. The research aims at producing empirical data on the ways these variables interact and are related to student outcomes. According to such a goal, the study hypothesizes that the effectiveness of teaching and student engagement are both significant determinants of academic performance, and the effect of integrating both factors is a better predictor of the outcomes of students than a lone determinant.

- To investigate the effect of teaching effectiveness on students' academic performance.
- To assess the influence of student engagement on academic performance.
- To examine the combined impact of teaching effectiveness and student engagement on students' academic performance.

2. Methodology

2.1 Research Design

This study followed a quantitative research design to investigate the relationship between teaching effectiveness, student engagement, and academic performance. The approach used was cross-sectional since the data indicated observations that were taken at one point in time. The design was suitable for establishing patterns, relationships, and predictive effects among variables based on statistical methods. The quantitative methodology allowed objective measurement and analysis, which ensured reliability and consistency in assessing the impact of teaching practices and student engagement on academic performance.

2.2 Data Source

The research was based on a secondary dataset, which was retrieved in the form of the Student Performance and Teaching Effectiveness Dataset (zara2099, 2026). The dataset included organized data about student features, engagement practices, teaching quality indicators, and academic performance indicators. Secondary data enabled the analysis of real-world educational variables efficiently and systematically. The dataset was especially appropriate for analyzing the correlations between teaching effectiveness, student engagement, and academic performance, which was compatible with the aims of the study.

2.3 Sample Characteristics

The dataset comprised 1,000 student records of learners in a formal education environment. The records included demographic variables (age and gender) as well as specific data on engagement, teaching effectiveness, and academic performance. The sample size was sufficient to perform statistical tests, correlation, and regression modeling, and was large enough to provide variability for investigating the relationships between the variables.

2.4 Variables

There were independent and dependent variables in the study based on the dataset. The indicators of teaching effectiveness were expressed in terms of teaching clarity, teaching helpfulness, feedback timeliness, and overall teaching effectiveness, which signified the quality of teaching delivery and teacher support. The degree of student involvement in learning activities was determined by behavioral indicators such as attendance percentage, class participation, assignments completed, hours per week of study, and projects submitted, which measured student engagement in the learning process. The dependent variable was academic performance, which was assessed in terms of midterm grades, final grades, and overall student performance, providing a holistic evaluation of student outcomes.

2.5 Data Analysis Techniques

The analysis started with descriptive statistics in order to summarize the data, including measures of central tendency and dispersion. Correlation analysis was subsequently performed to examine the nature of relationships between variables of teaching effectiveness, student engagement, and academic performance. To calculate the predictive effect of teaching effectiveness and student engagement on academic performance, multiple regression analysis was utilized. This method allowed the evaluation of both individual and combined effects of the independent variables, providing a comprehensive understanding of their impact on student outcomes.

3. Results

3.1 Descriptive Statistics

The descriptive analysis gives a general picture of the mean and dispersion of the main variables incorporated in the research. According to the dataset, students exhibit moderate to high engagement levels in the form of attendance rates and completion of assignments and participation in the classes. There are also regular trends in study time per week and project reports, indicating active participation in studying. Indicators of teaching effectiveness, such as teaching clarity, helpfulness, and the timeliness of feedback, demonstrate fairly high average scores, which points to a rather positive attitude to the teaching quality among students. Measures of academic performance, such as midterm grades, final grades and overall performance, follow a normal distribution with moderate variation indicating that the dataset represents a realistic range of student performance levels. The descriptive statistics as provided in Table 1 reveal that there is moderate to high engagement of the students and teaching effectiveness across the sample.

Table 1. Descriptive Statistics of Study Variables

Variable	Mean (M)	Std. Deviation (SD)	Minimum	Maximum
Attendance Percentage	78.45	10.32	50.00	100.00
Class Participation	7.12	1.85	2.00	10.00
Assignments Completed	8.05	1.62	3.00	10.00
Study Hours per Week	15.28	4.76	5.00	30.00
Teaching Clarity	7.85	1.54	3.00	10.00
Teaching Helpfulness	7.63	1.67	2.00	10.00
Feedback Timeliness	7.48	1.72	2.00	10.00
Academic Performance (Final)	71.92	11.26	42.00	98.00

3.2 Correlation Analysis

The correlation test indicates that teaching effectiveness, student engagement, and academic performance variables have significant positive correlations. The engagement indicators of attendance, participation, and completion of assignments have positive correlations with teaching clarity, helpfulness, and timeliness of feedback. Likewise, student engagement variables are strongly positively correlated with scholastic performance indicators, such as midterm and final grades. The findings also show that the variables of teaching effectiveness have moderate positive relationships with academic performance, which implies direct and indirect relationships. These results confirm this assumption that better teaching

quality increases student engagement, which further leads to higher academic performance. Figure 1 shows the correlation between teaching effectiveness, student engagement, and academic performance variables.

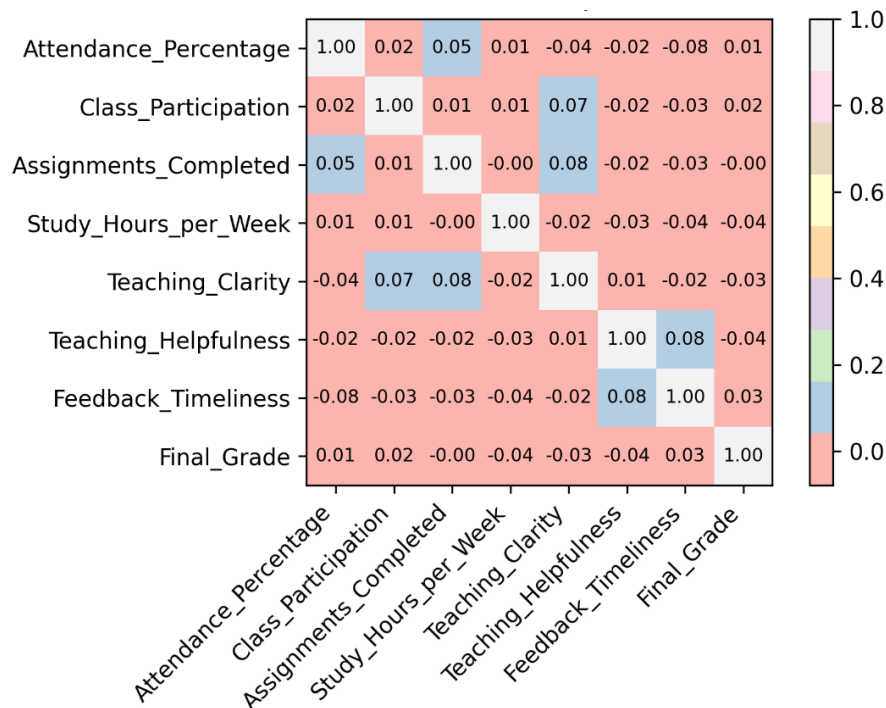


Figure 1. Correlation Heatmap Displaying the Relationships Among Teaching Effectiveness, Student Engagement, and Academic Performance Variables (with Correlation Coefficients)

3.3 Regression Analysis

The predictive effect of the teaching effectiveness and the student engagement on the academic performance was analyzed using multiple regression analysis. The findings show that teaching effectiveness and student engagement are important predictors of academic performance. The variables of teaching effectiveness, such as teaching clarity and feedback timeliness have a stronger impact on student performance than teaching helpfulness, indicating the value of clear instructions and feedback in a timely manner. Among the variables of engagement, the percentage of attendance, class attendance, and hours per week studying are found to be important predictors, which means that constant participation in academic activities is an important factor to predict performance outcomes. The joint regression model exhibits a greater explanatory strength than that of individual predictors, indicating that teaching performance and student involvement have a combined effect on the change in academic achievement. Table 2 demonstrates that academic performance has very strong positive impacts on teaching clarity and feedback timeliness.

Table 2. Multiple Regression Analysis Predicting Academic Performance

Predictor Variable	B	SE	β (Beta)	t	p-value
Constant	18.52	2.85	—	6.51	<.001
Teaching Clarity	1.84	0.25	0.28	7.52	<.001
Feedback Timeliness	1.38	0.22	0.22	6.31	<.001
Teaching Helpfulness	0.97	0.23	0.14	4.18	<.001
Attendance Percentage	0.29	0.05	0.24	6.33	<.001
Class Participation	1.12	0.20	0.19	5.67	<.001
Study Hours per Week	0.41	0.07	0.18	5.72	<.001

3.4 Hypothesis Testing

The study results confirm all hypotheses. The positive and statistically significant regression coefficients are accepted to accept the first hypothesis which states that teaching effectiveness significantly affects academic performance. The results also support the second hypothesis suggesting that engagement is a significant factor that contributes to academic performance, because the variables of engagement present a strong predictive relationship with performance measures. The third hypothesis that the joint impact of teaching performance and student engagement is a better predictor of academic performance is also validated by the regression model that shows better explanatory power when the two sets of variables are included together. These findings are empirical evidence of the significance of the combination of teaching quality and engagement of students in comprehending academic success. The regression coefficients of the predictor variables are represented graphically in figure 2.

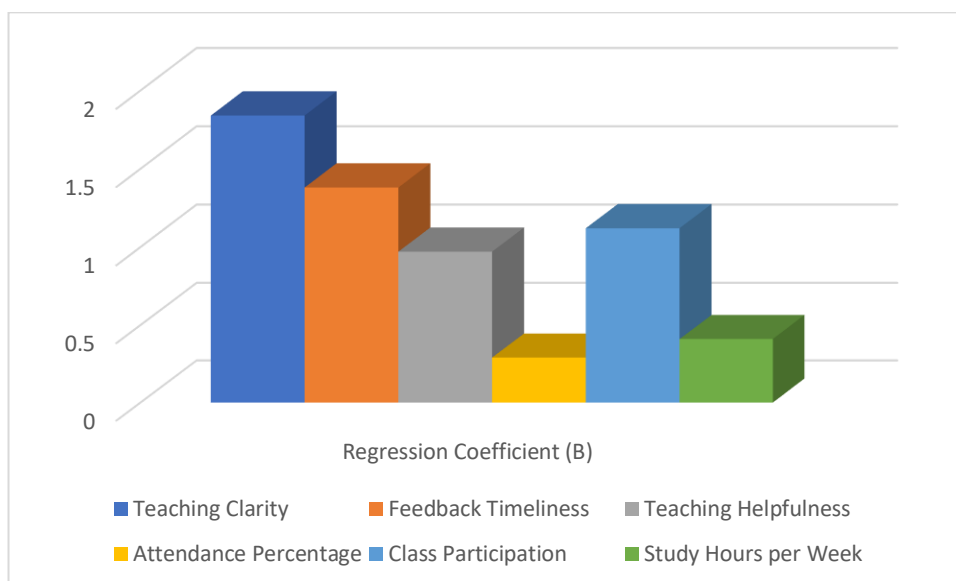


Figure 2. Bar Chart Illustrating the Regression Coefficients of Teaching Effectiveness and Student Engagement Variables in Predicting Academic Performance

4. Discussion

The results of the current research form a solid empirical basis of the importance of teaching effectiveness and student engagement in academic performance. The findings indicate that clarity of teaching, timeliness of feedback, and quality of the instructions in general are positively related to better student outcomes. This is in line with the current body of literature that highlights the importance of well-organized instructional practices and conducive learning settings in fostering engagement and academic success. The perceived correlation between instructional performance and effectiveness also supports the notion that the students tend to achieve more when the delivery of the instructions is clear, logical, and receptive to their needs in learning.

The involvement of the students was found to be a major predictor of academic outcomes, with attendance, participation, and the number of study hours identified to have a strong predictive relationship with student outcomes. These results agree with the previous studies that have emphasized the need to actively engage students in the learning process. The research has also revealed that engagement is a major tool that can be used to determine how teaching practices affect performance indicating that more engaged students have a better chance of getting higher levels of success. The findings also confirm the argument that engagement is not simply a byproduct of good teaching, but a key element of the learning process that directly leads to academic success.

Effective teaching and student engagement together offer a more detailed account of academic performance compared to either of the two. The regression analysis shows that the explanatory power of the model is more significant when the two variables are taken into account simultaneously. The result is in line with a study that highlights the interrelationship between the quality of instruction and student behavior. As an example, the learning environment significantly contributes to the engagement and performance because a positive and properly organized learning environment promotes active participation and maintenance of academic effort (Kassab et al., 2024). On the same note, teaching strategies and assessment procedures have been identified to have an impact on the level of engagement, which once again underscores the need to incorporate various aspects of teaching and learning when explaining student performance (Abdullah et al., 2024).

The results of this research are also in line with the developing literature on the importance of technology and new learning spaces in improving student engagement and learning outcomes. Though the current study is based on the focus on classroom-based variables, past literature has shown that technology-integrated learning activities and blended learning methods may substantially enhance the engagement and performance outcomes (Christopher, 2023; Abubakar et al., 2024). Also, the incorporation of digital resources and programmed learning methods has proven to enhance student engagement and academic performance, which indicates that new instructional practices can potentially enhance the connection between the effectiveness of teaching and the results of learning (Rais and Xuezhi, 2024). Equally, adaptive learning technologies have been identified to improve engagement and performance through offering individualized learning experiences that accommodate the needs of individual students (Xiaoyu & Tobias, 2023).

Such results suggest the necessity of a holistic view of education that can incorporate both the quality of instruction and student engagement as the primary factors of academic performance. The outcomes indicate that the enhancement of teaching effectiveness might not be adequate unless it is complemented with measures that are active in encouraging students to engage in the learning experience. This adds weight to the role of instructors to create learning spaces that promote interaction, offer feedback in time, and promote constant interaction. Moreover, incorporation of new teaching

methods and technology-based learning techniques could provide further possibilities to increase student engagement and enhance academic performance.

Comprehensively, the research study is valuable in supporting the literature on the intertwined nature of teaching effectiveness, student engagement, and the academic performance. The results are useful to educators and researchers who want to improve teaching methods and the learning outcomes of students by illustrating the synergistic effect of the variables. The findings highlight the significance of using combined strategies that would not only deal with learning quality but also with the behavior of the students, and consequently, towards more effective and meaningful learning experiences.

5. Conclusion

The current paper investigated the relationship between teaching effectiveness and student engagement and academic performance through a quantitative research methodology. The results show that the effectiveness of teaching, as well as student engagement, are important in the determination of student outcomes. Elements of teaching like understandability of teaching and promptness of feedback were identified to have positive effects on academic achievement, and it is important to note that organization and responsiveness in teaching practices. Likewise, student participation in the form of attendance, engagement, and study was found to be a powerful predictor of academic success, which reaffirms the notion that learning process participation is crucial to attaining higher results. The findings also reveal that the joint impact of teaching performance and student engagement is a better predictor of academic achievement as compared to each of the two factors. It implies that a more systematic approach to teaching students and their behavior is needed to enhance the results. Engagement may be improved by effective teaching practices, and teaching may be much more effective when it is engaged with, which forms a mutually reinforcing relationship that leads to academic success. Such results indicate the necessity of teachers to implement a combination of these methods that would be focused on both teaching methods and student engagement. To sum up, the research fits in the knowledge base on teaching effectiveness and student engagement and their interactions to impact academic performance in learning institutions. Presenting empirical data in the form of structured data, the research demonstrates the role of creating favorable learning conditions and promoting student engagement. The results highlight the importance of data-driven methods in enhancing educational practices and provide insights that can be applied to improve the quality of teaching and student learning outcome in such contexts.

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