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# TEACHER–STUDENT INTERACTION AND ITS RELATIONSHIP WITH ACADEMIC ENGAGEMENT AND PERFORMANCE IN HIGHER EDUCATION

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## Abstract

Teacher–student interaction plays an important role in shaping academic engagement and educational outcomes in higher education. This study explored the correlation between teacher-student interaction, academic involvement and perceived academic performance of university students in Bangladesh. The research design was quantitative, cross-sectional and the data was obtained from the secondary survey of 399 students from various academic departments of the university. Descriptive statistics, Spearman correlation and Mann–Whitney U tests were conducted to explore the interaction patterns, engagement indicators, perceived academic performance and group differences. The results showed moderate-to-high level of teacher-student interaction with positive relationship being the highest mean score (3.54 ± 1.17). There was a significant relationship between positive teacher–student relationships and support related academic engagement ($\rho = 0.499$, $p < 0.001$) as well as with perceived academic performance ($\rho = 0.451$, $p < 0.001$). High frequency of interaction, approachability of teachers, academic assistance and feedback were also positively associated with measures of engagement. There were no significant differences between gender categories on engagement and perceived performance measures, although a small statistically significant difference was found in the frequency of interactions. The results point toward the need for positive communication, teacher accessibility, and positive feedback that are conducive to positive learning experiences. A self-reported performance measure and cross-sectional design, however, preclude causal inferences. Improved teacher–student relationships can foster engagement in learning, and future longitudinal research with objective measures of achievement is suggested for further evidence.

**Keywords** – Teacher–Student Interaction; Academic Engagement; Perceived Academic Performance; Higher Education; Academic Support

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## 1. Introduction

Higher education is important to develop a set of academic knowledge, critical thinking and professional skills among students. Teachers' relationships with students are important in the quality of educational experiences, in addition to the curriculum design and teaching methods. Teacher – student interaction is effective and provides a conducive learning environment to promote active learning, motivation to learn and better learning experiences. Constructivist learning approaches stress the significance of interactive learning environments to formulate students' critical thinking, creativity and problem-solving skills that will support academic achievement (Almulla, 2023). In addition, the relationship between individual learning behavior and learning environment plays a role in determining students' engagement in learning, which indicates the role of supporting institutional and instructional conditions (Li & Xue, 2023). Moreover, educational engagement theory is used as a conceptual basis to understand the students' participation and involvement in educational activities (Rachmad, 2022).

The relationship between the teacher and the student plays a vital role in good teaching and learning in Higher Education. It encompasses classroom communication, academic guidance and feedback, teacher availability, and interpersonal support. Positive interactions will help to build students' confidence, encourage engagement in the classroom and love of learning. Immediacy behaviours of teachers, such as responsive communication and supportive interpersonal relationship, have been found to be related to students' willingness to communicate and academic engagement (Hu & Wang, 2023). Student interaction, student self-regulation, and social presence are significant factors that affect student learning engagement in online higher education, where maintaining communication in online learning is crucial (Miao & Ma, 2022). Likewise, teacher–student interaction and social presence have been found to be significant factors that affect student engagement in online learning activities (Miao et al., 2022). In online learning contexts, positive communication with teachers and engagement with learning can also enhance students' participation in learning (Ong & Quek, 2023).

Academic engagement is defined as students' behavioral, emotional, and cognitive engagement in learning activities. It involves being engaged in class, paying attention, being motivated to learn, and completing learning activities. Engagement is one of the key factors that are linked to students' learning experiences and academic success. Instructional scaffolding can help in motivating students, improving their engagement, and achieving learning goals by offering learners adequate academic guidance and structured learning assistance (Acosta-Gonzaga & Ramirez-Arellano, 2022). Academic engagement may also be influenced by individual or situational factors that suggest that students' engagement is dependent on their personal characteristics and educational experiences (Alonso-Tapia et al., 2023). Social support has been found to be related to university students' academic engagement via relationships with life satisfaction and academic motivation (Chen et al., 2023). In addition, there is a close relationship between teacher support and academic

self-efficacy, student engagement, and academic achievement in online learning environments (Huang & Wang, 2023). The connection between the academic self-efficacy and academic achievement may also be clarified by academic engagement, which plays a crucial role in understanding academic outcomes in the context of education (Meng & Zhang, 2023; Mallik, 2023).

Though several studies have reviewed the relationship among teacher support, academic engagement and academic performance, there is a need to explore the relationship between these variables in different higher education contexts. Considering the above-mentioned teacher attributes (approachability, frequency of interaction, academic assistance, and feedback) along with the above-mentioned classroom attributes (engagement, perceived academic performance) may give a richer picture of student learning. University students' evidence from Bangladesh can help develop the understanding of these associations in each institutional and cultural context. Hence, the current study analyses teacher–student interaction and its association to academic engagement and perceived academic performance through secondary survey data of the universities in Bangladesh.

**Research Objectives**

- To assess teacher–student interaction, academic support, and academic engagement among university students.
- To examine the relationship between teacher–student interaction and academic engagement in higher education.
- To evaluate the association between teacher–student interaction, academic support, and perceived academic performance among university students.

## 2. Materials and Methods

### 2.1. Study Design and Data Source

The present study was designed as quantitative cross-sectional research, the secondary survey was used to explore the correlation between teacher–student interaction, academic engagement and perceived academic performance in higher education. The data were collected from publicly available Teacher-Student Relationship and Academic Performance Survey Dataset from Bangladeshi Universities: A Student-conducted Study (Azam, 2025). This survey contained teacher communication, academic assistance, feedback, classroom involvement, and academic outcomes. The study was aimed at looking at the relationships between these factors, but no experimental intervention was done.

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### 2.2. Study Population and Sample Characteristics

The study contained 399 student responses from universities of Bangladesh from academic departments of Computer Science and Engineering (CSE), Electrical and Electronic Engineering (EEE), Business Administration (BBA), English, Software Engineering (SWE). The following demographic data were provided: age group, sex, level of university, academic department and university affiliation. The recorded responses were then analysed to compare the characteristics of the students and differences in learning interaction and engagement by the different groups.

### 2.3. Study Variables and Measurements

#### 2.3.1. Teacher–Student Interaction

The indicators used in the assessment of teacher student interaction were interaction frequency (INTRCT), academic goal support (AGOALS), teacher approachability (ASSIS), positive relationships (POSTV), and academic feedback (FDBC). These variables combined the experience of communication, accessibility and academic support offered by teachers. Responses were collected and were mostly on a numerical scale from 1 to 5 and were analysed for trends in teacher/student interaction.

#### 2.3.2. Academic Engagement

Academic engagement was measured using indices of engagement with supportive teachers (SUPPO), encouragement to participate in academic activities (ENCG), and teaching-related engagement experiences (TEFF). These measures indicated students' involvement and engagement in positive learning experiences. Since the survey did not include a thorough validated academic engagement scale, individual indicators were analysed individually because the survey did not provide a comprehensive validated academic engagement scale.

#### 2.3.3. Perceived Academic Performance

The perceived academic performance was measured by items on the impact of positive teacher-student relationships on academic performance (RLTN) and the perceived impact of the online compared to in-person relationships between teacher and student (APER). These indicators were students' perceptions of their performance and not actual grade or examination scores.

#### 2.3.4. Demographic and Academic Characteristics

Demographic and academic parameters were age category (AGE), gender (GDR), university level (UL), academic department and university affiliation. These characteristics were used to describe the students and to explore the interaction and engagement pertinent to the differences between the student groups.

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### 2.4. Data Preparation and Variable Coding

There were 29 columns and 399 observations in the survey file: the 29 columns included demographic information, structured answers, and other fields from the survey; and the 399 observations were the items in the survey. Appropriate variables were determined and the answer categories were checked for consistency. The analytical variables were from the questionnaire and did not include administrative information or summary fields in the spreadsheet. Responses to numerical indicators on the survey were analysed according to the scales of the measurement and categorical responses were retained as they were provided. If the conceptual relevance and acceptable internal consistency supported the use of composite measures, they were used.

### 2.5. Statistical Analysis

Data on study characteristics were summarized using descriptive statistics such as frequencies, percentages, means and standard deviations. Pearson or Spearman correlation was used to explore relationships among teacher–student interaction, engagement and perceived academic performance, based on characteristics of variables. Independent-samples t-tests or Mann–Whitney U tests would have been employed, if suitable for the two-group comparisons, and simple linear regression would have been employed if suitable for the numerically defined outcomes. When applicable internal consistency was determined by Cronbach's alpha. A p value of $< 0.05$ was considered statistically significant. Findings were interpreted as association and not causation.

### 2.6. Ethical Considerations

The study was a secondary survey study that did not involve any participants. Personal identifiers were not used, and results were reported in aggregate to ensure confidentiality. Ethical approvals and informed consent (as recorded in the original study) should be reported. Data were only used for academic research purposes.

## 3. Results

A total of 399 students' responses from the universities were analysed. Results are displayed based on demographic, teacher–student interaction, academic engagement, perceived academic performance, and by student groups.

### 3.1. Demographic and Academic Characteristics of Respondents

The number of respondents in the study was 399 from various academic departments. Computer Science and Engineering (CSE) was the largest group (36.3%) followed by Electrical and Electronic Engineering (EEE; 13.0%). Majority of the respondents were in the age group 2 (99.0%) and university level category 1 (98.2%). 69.7% of the respondents were classified as gender category 1. As for the overall classification of teacher–student relationship, 42.1% were classified

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as high while 26.3% as extremely high. The distribution of the population is shown in Table 1.

**Table 1. Demographic and Academic Characteristics of University Students (N = 399)**

| Characteristic | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Age | Code 2 | 395 | 99.0 |
| | Code 3 | 4 | 1.0 |
| Gender | Code 1 | 278 | 69.7 |
| | Code 2 | 120 | 30.1 |
| | Code 3 | 1 | 0.3 |
| University level | Code 1 | 392 | 98.2 |
| | Code 2 | 6 | 1.5 |
| | Code 3 | 1 | 0.3 |
| Department | CSE | 145 | 36.3 |
| | EEE | 52 | 13.0 |
| | English | 22 | 5.5 |
| | BBA | 21 | 5.3 |
| | SWE | 21 | 5.3 |
| | Other departments | 138 | 34.6 |
| Overall teacher–student relationship | Extremely high | 105 | 26.3 |
| | High | 168 | 42.1 |
| | Medium | 75 | 18.8 |
| | Poorly engaged | 51 | 12.8 |

### 3.2. Patterns of Teacher–Student Interaction and Academic Support

Teacher–student interaction indicator scores were at a moderate to high level in the survey. The highest mean score was for positive teacher–student relationships (3.54 ± 1.17); followed by interaction frequency (3.45 ± 1.16) and teacher approachability (3.39 ± 1.12). The mean of academic feedback (3.31 ± 1.18) was lower compared to the other feedback. Fifty-eight percent (58.4%) of the students responded 4 or 5 to positive relationships and 57.4% to interaction frequency. Descriptive results are reported in Table 2 and Figure 1 shows the variation on the indicators of interaction.

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**Table 2. Descriptive Statistics of Teacher–Student Interaction and Academic Support**

| Variable | Mean ± SD | Responses 4–5 (%) |
|---|---|---|
| Interaction frequency (INTRCT) | 3.45 ± 1.16 | 57.4 |
| Academic goal support (AGOALS) | 3.35 ± 1.19 | 46.9 |
| Teacher approachability (ASSIS) | 3.39 ± 1.12 | 55.9 |
| Positive relationships (POSTV) | 3.54 ± 1.17 | 58.4 |
| Academic feedback (FDBC) | 3.31 ± 1.18 | 46.6 |
| Support-related engagement (SUPPO) | 3.30 ± 1.17 | 54.1 |
| Participation encouragement (ENCG) | 3.40 ± 1.22 | 55.6 |
| Teaching-related response (TEFF) | 2.76 ± 1.07 | 27.8 |
| Perceived relationship–performance link (RLTN) | 3.49 ± 1.17 | 58.9 |
| Online versus in-person performance perception (APER) | 2.59 ± 0.99 | 16.8 |

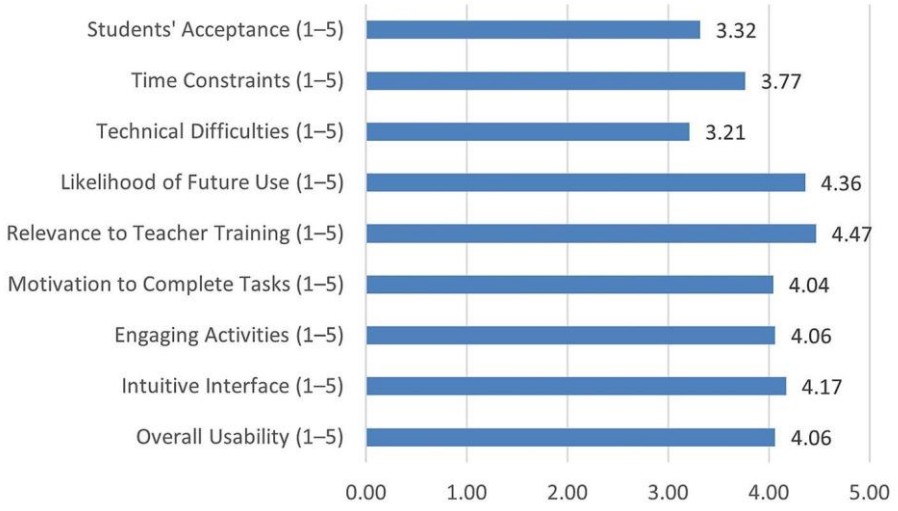


**Figure 1. Teacher–Student Interaction and Academic Support Indicators**

### 3.3. Academic Engagement and Classroom Participation

Academic engagement was assessed through supportive teacher engagement, participation encouragement, and teaching-related responses. Participation encouragement had a mean of 3.40 ± 1.22, while supportive teacher engagement averaged 3.30 ± 1.17. The teaching-related response indicator showed a lower mean of 2.76 ± 1.07. Perceived relationship-related academic performance averaged 3.49 ± 1.17, whereas the online versus in-person performance perception indicator averaged 2.59 ± 0.99. These descriptive patterns are illustrated in Figure 2.

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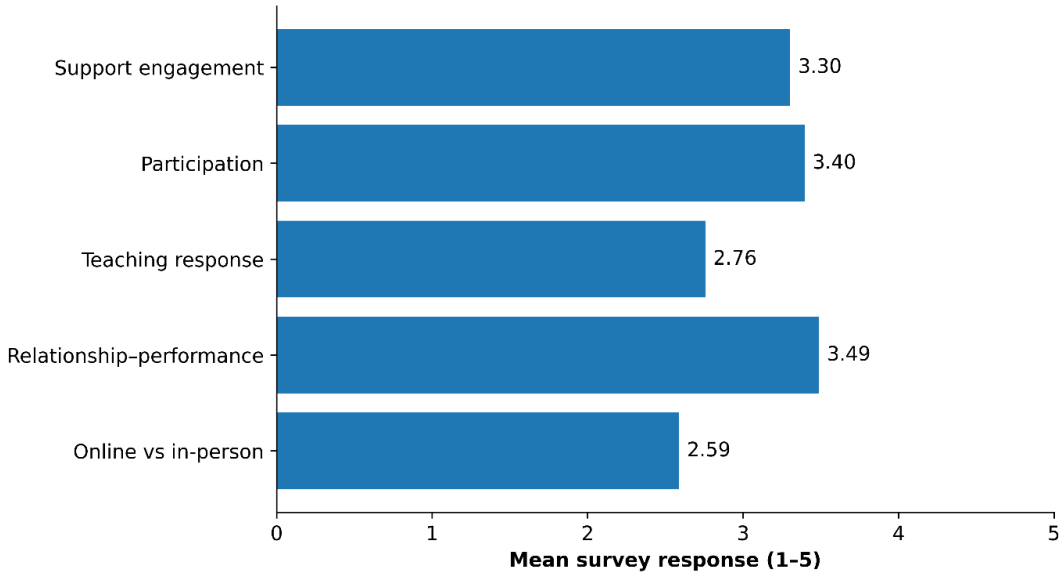


**Figure 2. Academic Engagement and Perceived Performance Indicators**

### 3.4. Relationship Between Teacher–Student Interaction and Academic Engagement

Spearman correlation analysis revealed positive relationships between teacher–student interaction and the indicators of academic engagement. Positive teacher–student relationship was most highly associated with support-related engagement ($\rho = 0.499$, $p < .001$) followed by frequency of interaction ($\rho = 0.482$, $p < .001$). There was also a positive correlation with participation encouragement and the frequency of interaction ($\rho = 0.479$, $p < 0.001$). The relationships with the teaching-related response indicator were weaker, but still statistically significant. The results for these are given in Table 3, while the relationships between the measures used in the study are displayed in Figure 3.

**Table 3. Correlations Between Teacher–Student Interaction and Academic Engagement**

| **Interaction indicator** | **Support-related engagement (SUPPO), ρ** | **Participation encouragement (ENCG), ρ** | **Teaching response (TEFF), ρ** |
|---|---|---|---|
| Interaction frequency | 0.482 | 0.479 | 0.167 |
| Academic goal support | 0.467 | 0.382 | 0.198 |
| Teacher approachability | 0.453 | 0.413 | 0.212 |
| Positive relationships | 0.499 | 0.454 | 0.185 |
| Academic feedback | 0.471 | 0.335 | 0.228 |

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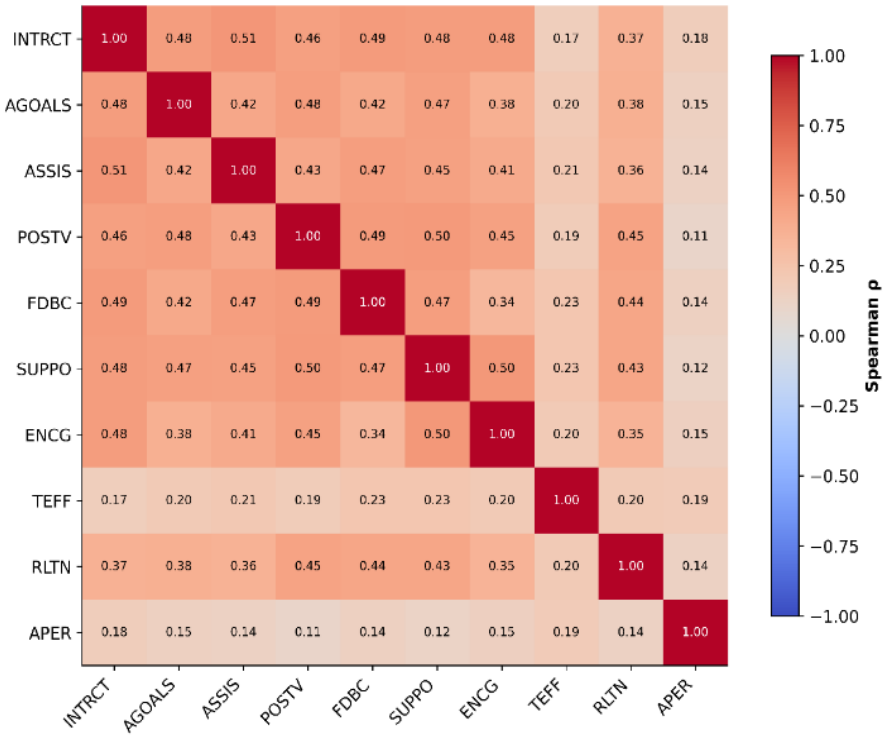


**Figure 3. Correlation Matrix of Teacher–Student Interaction, Engagement, and Perceived Performance**

Heatmap illustrating Spearman correlations among ten survey indicators. Positive and negative associations are represented by the color scale, with correlation coefficients displayed within cells.

### 3.5. Teacher–Student Interaction and Perceived Academic Performance

Positive relationships were found between teacher–student interaction and teacher perceived academic performance indicators. The strongest correlation with the perceived relationship–performance indicator was for positive teacher–student relationships ($\rho = 0.451$, $p < 0.001$) followed by academic feedback ($\rho = 0.435$, $p < 0.001$). Positive statistically significant relationships were also found between academic goal support and interaction frequency. Conversely, the correlations between in-person and online performance perception indicator were relatively low. The correlation results are shown in Table 4 and the distribution of perceptions about the performance in the different categories of interaction frequency is shown in Figure 4.

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**Table 4. Associations Between Teacher–Student Interaction and Perceived Academic Performance**

| Predictor | RLTN, ρ | RLTN, p-value | APER, ρ | APER, p-value |
|---|---|---|---|---|
| Interaction frequency | 0.371 | <0.001 | 0.175 | <0.001 |
| Academic goal support | 0.381 | <0.001 | 0.147 | 0.003 |
| Teacher approachability | 0.365 | <0.001 | 0.136 | 0.007 |
| Positive relationships | 0.451 | <0.001 | 0.107 | 0.033 |
| Academic feedback | 0.435 | <0.001 | 0.141 | 0.005 |
| Support-related engagement | 0.435 | <0.001 | 0.118 | 0.018 |
| Participation encouragement | 0.354 | <0.001 | 0.154 | 0.002 |

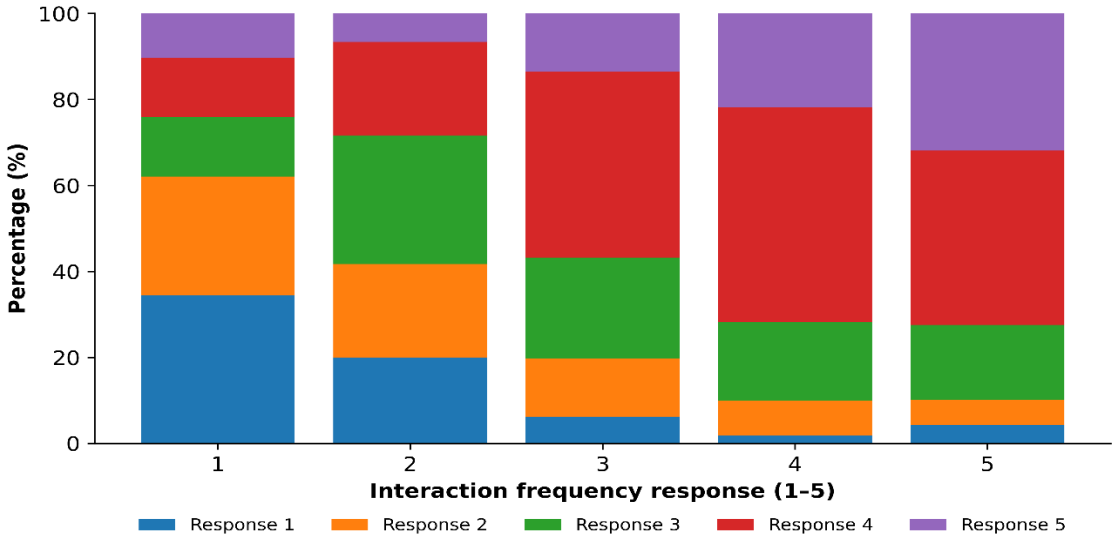


**Figure 4. Distribution of Perceived Academic Performance Responses Across Teacher–Student Interaction Levels**

Stacked percentage chart showing the distribution of RLTN response categories across the five recorded teacher–student interaction frequency levels.

### 3.6. Differences in Teacher–Student Interaction and Engagement Across Student Groups

The comparison between the two large gender coding groups revealed a slight difference in the number of interactions. The mean interaction frequency score of students in gender category 1 (3.52) was higher than that in gender category 2 (3.28) and there was a statistically significant difference between the two ($p = 0.048$). But there were no significant differences in support related engagement, participation encouragement, or perceived achievement in academic performance and relationships. The summary of the group comparisons is provided in Table 5.

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**Table 5. Comparison of Teacher–Student Interaction and Engagement Across Gender Categories**

| Variable | Gender code 1, mean | Gender code 2, mean | p-value |
|---|---|---|---|
| Interaction frequency | 3.52 | 3.28 | 0.048 |
| Support-related engagement | 3.29 | 3.32 | 0.728 |
| Participation encouragement | 3.39 | 3.41 | 0.577 |
| Perceived relationship–performance link | 3.54 | 3.37 | 0.204 |

The analysis uses the original 399 survey responses. Its findings are limited to associations between recorded survey measures and perceived academic performance, not objectively measured academic achievement. The original questionnaire's coding key should be verified before making stronger claims about the direction or meaning of individual response categories.

## 4. Discussion

This study investigated teacher–student interaction, academic engagement, and perceived academic performance of 399 university students in Bangladesh. The results showed that teacher – student interaction was moderate – high with positive relationship having the highest mean score (3.54 ± 1.17). There were significant positive correlations between teacher–student interaction and academic engagement, especially the positive interaction and support related engagement ($\rho = 0.499$, $p < 0.001$). A perceived academic performance was also correlated with positive relationships ($\rho = 0.451$, $p < 0.001$). The results indicate that positive teacher–student rapport is linked to positive perceptions of academic engagement and academic performance in higher education.

The results showed that there are very strong relationships between teacher–student interaction and academic engagement. Students' responses to the interactions were especially linked to the frequency of interaction, teacher approachability, and positive interpersonal relationships. The significance of teacher–student relationships in fostering engagement in online learning has been emphasized by previous studies, which have also attributed this to academic motivation (Akram & Li, 2024). There is also a correlation between lecturer-student communication and the participation of students in the classroom, which highlights the importance of communication and academic assistance in engaging students in learning (Oanh & Nguyen, 2025). Likewise, patterns of interactions in university settings have been associated with students' academic engagement (Odutayo et al., 2024). This is reinforced by a study of teacher immediacy and interpersonal interaction, which highlights the need for accessible and responsive teaching practices to cultivate

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students' academic engagement (Yuan, 2024). The results suggest that positive academic relationships can motivate more student participation and involvement (Owusu-Agyeman & Moroeroe, 2023).

There was a strong correlation between positive teacher–student relationships and academic feedback and perceived academic performance, indicating that students who felt positive relationships with their teachers were more likely to rate their academic performance level also as positive. Past studies have highlighted the role of innovative pedagogical strategies and inclusive teaching practices for students' learning outcomes (Bhuttah et al., 2024). Secondary education research findings have also been correlated with student–teacher relationships and performance, but there are differences in the educational context, and it is not possible to make a direct correlation (Imran et al., 2023). Teacher–student relationships have additionally been associated with academic achievement, with parental involvement influencing this association (Ma et al., 2022). Quality of teaching and student–faculty interaction has also been investigated as a mutually affecting phenomenon in relation to engagement in the learning process (Wang, 2024). The current study, however, evaluated perceived academic performance and not actual academic grades; thus, the results of this study should not be taken as evidence of academic achievement improvements (Prananto et al., 2025).

Group comparisons revealed a small statistically significant difference in the number of interactions for the two predominant gender groupings ($p = 0.048$) but not in engagement or perceived performance indicators. Based on these results, a hypothesis is that the experience of interaction may differ between different groups of students without resulting in a difference in their perceptions of engagement. Previous studies have found a connection between academic engagement, psychological well-being, and supportive educational environments (Chaudhry et al., 2024). Academic engagement and emotional experiences are also linked to technology-supported learning experiences (Guo & Wang, 2025). Furthermore, it was found that teachers' affective scaffolding is associated with students' academic involvement and psychological health (Pan et al., 2023). These studies offer background support to understanding how students' learning experiences might differ, but do not directly provide the demographic patterns seen in the present study.

The results point to the significance of teacher availability, positive feedback, and messages in the university learning context. Student engagement can be enhanced at higher education institutions by fostering frequent engagements between students and faculty members and by providing feedback to students. Personalized learning methods can offer further possibilities to take care of individual learning requirements (Naseer et al., 2024). Social media as a learning tool can also be used correctly in educational practice and have a positive effect on students' academic motivation (Ramzan et al., 2023). In addition, knowing what accounts for such participation in the online learning environment can help create more inclusive and participatory learning environments (Vezne et al., 2023).

This study has limitations due to its cross-sectional design, self-reported responses and the lack of objective academic performance measures. Geographically, the sample had been restricted to Bangladesh and results may not be generalizable. Further, the engagement indicators were not a fully validated measure of academic engagement. Future research should look at these relationships in a more comprehensive fashion with validated academic records, validated engagement scales, and larger and more diverse samples; and longitudinal research designs.

## 5. Conclusion

The current study aimed to explore the association between teacher–student interaction, academic engagement and perceived academic performance in university students of Bangladesh. Results indicated that there were strong positive relationships between supportive teacher–student relationships, academic engagement and perceptions of performance. Positive teacher–student relationships had the highest mean score of the interaction indicators ($3.54 \pm 1.17$) and was significantly associated with support-related engagement ($\rho = 0.499$, $p < 0.001$) and perceived academic performance ($\rho = 0.451$, $p < 0.001$). Teacher approachability, frequency of teacher interaction, academic assistance and constructive feedback also were linked to positive engagement-related responses. The results show that supportive communication and positive interpersonal relationships are important in Higher Education. Through frequent contact between teachers and students, a positive learning environment may be created through the classrooms, enhancing students' participation, motivation and learning. However, there was no significant difference between the genders in most of the items measuring interaction or performance. The study highlights the need to improve accessibility, academic guidance and feedback practices within universities. But conclusions to the actual performance of the children in school cannot be drawn due to the lack of objective academic achievement records and because of the cross-sectional design and use of self-report measures, causal interpretations are somewhat limited. Future research should be done longitudinally, with engagement measures validated and with verified academic records. Overall, the findings suggest that positive teacher–student relationships are important correlates of academic engagement and perceived educational outcomes in higher education.

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