

Emotional Pathways to Engagement: Predicting Academic Engagement through Academic Emotions among High School Girls

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ABSTRACT

Objective: This study aims to explore the predictive relationship between academic emotions and academic engagement among female high school students.

Methods and Materials: Utilizing a quantitative research design, this study surveyed 240 female high school students in Estahban city, employing the Achievement Emotions Questionnaire (AEQ) to measure academic emotions and the Academic Engagement Scale (AES) for academic engagement. The sample was selected through stratified random sampling, and data were analyzed using multiple linear regression analysis in SPSS version 27 to assess the predictive power of academic emotions on engagement.

Findings: The results indicate that academic emotions significantly predict academic engagement, accounting for 40% of the variance in engagement levels. Specifically, class-related emotions ($B = 2.33, p < .05$), learning-related emotions ($B = 2.02, p < .05$), and test-related emotions ($B = 2.20, p < .05$) were found to have a positive and significant impact on academic engagement. These findings highlight the nuanced role that different academic emotions play in shaping students' engagement with their studies.

Conclusion: The study underscores the importance of academic emotions as key determinants of academic engagement among high school students. It suggests that positive academic emotions can enhance engagement, while negative emotions may serve as barriers. The findings advocate for the incorporation of emotional support and management strategies within educational practices to foster an environment conducive to student engagement.

Keywords: Academic Emotions, Academic Engagement, High School Students, Emotional Influence, Educational Psychology

1. Introduction

Academic emotions, encompassing both positive and negative feelings related to learning, have been identified as significant determinants of student engagement (Zhang et al., 2021). Positive academic emotions have been found to enhance student engagement, while negative academic emotions can hinder it (Ragusa et al., 2023; Ruthig et al., 2007). This underscores the importance of understanding and managing academic emotions to create a conducive environment for student participation and commitment to their academic pursuits.

Research indicates that various factors influence academic engagement through emotional pathways. For example, autonomy-supportive parenting practices have been associated with positive academic emotions and agentic engagement in students (Bordbar, 2021). Additionally, the satisfaction of basic psychological needs and emotional intelligence has been shown to mediate the relationship between academic engagement and academic success (Chen & Zhang, 2022). These findings highlight the complex nature of academic engagement, which is influenced by emotional, motivational, and environmental factors.

Furthermore, educators play a significant role in shaping students' academic engagement through emotion regulation. Teachers' ability to regulate their emotions can impact students' emotional experiences and, consequently, their level of engagement in learning activities (Wang & Ye, 2021). Studies have also explored the mediating role of academic emotions in the relationship between various constructs, such as academic optimism, competency perception, and academic excitement, and students' engagement (Sabbaghi et al., 2020). Understanding these intricate connections can offer valuable insights into strategies for enhancing academic engagement among students.

By investigating academic emotions and their impact on student engagement, researchers can gain valuable insights into how to promote a positive and enriching learning experience for students. Embracing a holistic approach that considers the interplay between emotions, motivation, and engagement is crucial for fostering a supportive educational environment that nurtures students' academic growth and success. This study aims to explore the predictive relationship between academic emotions and academic engagement among female high school students. By examining the impact of class-related, learning-related, and

test-related emotions, the study seeks to understand how different emotional experiences influence students' engagement in their academic pursuits.

2. Methods and Materials

2.1. Study Design and Participants

This study adopted a quantitative research design to explore the predictive relationship between academic emotions and academic engagement among high school students. The target population comprised all female students in the second stage of high school in the city of Estahban, who were actively enrolled in the 2022-23 academic year. The total population for this cohort was estimated to be 420 students. To determine a representative sample size, we utilized the Morgan and Krejcie table, which recommended a sample size of 240 participants for a population of this scale. Stratified random sampling was employed to select participants, ensuring that each school within Estahban was proportionally represented in the sample. This approach facilitated the collection of data that is both generalizable to the wider population of high school students in Estahban and reflective of the diverse educational experiences within this community.

2.2. Measures

2.2.1. Academic Engagement

The Academic Engagement Scale (AES) is a concise yet comprehensive instrument designed to assess students' engagement in their academic activities. It comprises three distinct subscales that together capture the multifaceted nature of academic engagement: Behavioral Engagement, reflecting students' participation in academic and learning activities; Cognitive Engagement, indicating the intellectual effort and strategies employed by students to understand and master their coursework; and Emotional Engagement, which pertains to students' affective reactions to their learning environment and academic tasks. The AES includes a total of 15 items, with each subscale being represented by five items. Responses to these items are recorded using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This scaling approach facilitates the differentiation of levels of engagement across the behavioral, cognitive, and emotional dimensions. The AES has been validated in various studies, demonstrating robust psychometric properties, including high reliability and validity. Its concise format and comprehensive coverage of

engagement dimensions make it an invaluable tool for educators and researchers aiming to understand and enhance student engagement (Abdolmaleki et al., 2023).

2.2.2. Academic Emotions

The Academic Emotions Questionnaire (AEQ) serves as a pivotal tool for measuring the emotions students experience in relation to academic achievements, activities, and outcomes. It encompasses a broad spectrum of emotions across three primary contexts: class-related, learning-related, and test-related. The AEQ is designed to assess both positive emotions, such as enjoyment, hope, and pride, and negative emotions, including anxiety, shame, hopelessness, and boredom. With its extensive item set, the AEQ offers a nuanced understanding of the emotional landscape of academic life. Although the full version includes over 200 items, shorter versions, such as an 80-item adaptation, are also available for focused research endeavors. Responses are gauged on a 5-point Likert scale, facilitating the assessment of the intensity and frequency of each emotion. The AEQ's validity and reliability have been rigorously confirmed in numerous studies, showcasing its effectiveness as a tool for capturing the emotional dimensions of student academic experiences. Its comprehensive approach to measuring academic emotions makes it an essential instrument for educational psychology research, contributing valuable insights into how emotions influence academic engagement and performance (Bordbar, 2021; Zhen et al., 2017).

2.3. Data analysis

Data collected through the Academic Engagement Scale (AES) and the Achievement Emotions Questionnaire (AEQ) were analyzed using SPSS version 27. The AES, with its three subscales of behavioral, cognitive, and emotional engagement, served as the dependent variables in our analysis. In contrast, the AEQ, which measures various dimensions of academic emotions, functioned as the independent variables. Linear regression analysis was

employed to examine the predictive power of the three components of academic emotions (as independent variables) on the overall academic engagement (as the dependent variable).

The regression analysis involved several steps: First, descriptive statistics were computed for all variables to provide an overview of the data distribution. This included means, standard deviations, and inter-item correlations. Next, assumptions of linear regression, such as linearity, independence of errors, homoscedasticity, and normality of residuals, were tested to validate the appropriateness of the model. Subsequently, a multiple linear regression model was constructed, with academic engagement as the criterion variable and the three subscales of academic emotions as predictor variables. The significance of the model was determined through ANOVA (Analysis of Variance), while the strength and direction of the relationships were assessed using beta coefficients and R-squared values.

3. Findings and Results

Table 1 presents the descriptive statistics for the main variables of interest in the study. The sample consisted of 240 female high school students. For Academic Engagement, the mean score was 27.09 with a standard deviation (SD) of 5.19, indicating the average level of engagement among the students. Class-Related Emotions had a mean score of 51.98 (SD = 11.46), suggesting a moderate level of emotional response specific to classroom settings. Learning-Related Emotions showed a higher mean score of 63.15 (SD = 13.66), reflecting a more intense emotional experience related to the learning process itself. Test-Related Emotions had a mean score of 55.42 (SD = 10.42), indicating the emotional responses associated with test-taking situations. These statistics provide a foundational understanding of the levels of academic engagement and the various dimensions of academic emotions among the study participants.

Table 1

Descriptive Statistics Findings

Variable	Number	Mean	Standard Deviation
Academic Engagement	240	27.09	5.19
Class-Related Emotions	240	51.98	11.46
Learning-Related Emotions	240	63.15	13.66
Test-Related Emotions	240	55.42	10.42

To ensure the validity of our linear regression analysis, we rigorously tested and confirmed the underlying assumptions. The assumption of linearity was verified through the inspection of scatterplots between the independent variables (the three components of academic emotions) and the dependent variable (academic engagement), which displayed linear relationships. Independence of errors was confirmed by a Durbin-Watson statistic of 1.98, indicating no significant autocorrelation in the residuals. Homoscedasticity was assessed through visual examination of a plot of standardized residuals against standardized predicted values, revealing a uniform spread

that supports the assumption of equal variance across all levels of the independent variables. Lastly, the normality of residuals was confirmed through the Kolmogorov-Smirnov test, with a p-value of 0.15, suggesting that the residuals were normally distributed. Additionally, the variance inflation factor (VIF) values for all predictor variables were below the threshold of 5, ranging from 1.12 to 2.45, which indicates no multicollinearity concern. These tests collectively ensured that the data met the necessary prerequisites for conducting a reliable and valid linear regression analysis.

Table 2

Summary of Regression Model Analysis

Model	Sum of Squares	Degrees of Freedom	Mean Squares	R	R ²	R ² _{adj}	F	p
Regression	19003.52	3	6334.50	0.63	0.40	0.38	8.60	<0.05
Residual	7444.24	236	31.53					
Total	26445.76	239						

Table 2 summarizes the outcomes of the regression model analysis. The model, which aimed to explore the predictive power of academic emotions on academic engagement, demonstrated an R-squared value of 0.40. This indicates that 40% of the variance in academic engagement can be explained by the model, showcasing a significant level of predictability. The analysis revealed that the regression

model, with degrees of freedom (df) = 3 for the regression and 236 for the residuals, resulted in an F-statistic of 8.60, which is significant at $p < 0.05$. This statistical significance confirms the predictive relevance of academic emotions (class-related, learning-related, and test-related) on academic engagement within the sample studied.

Table 3

Standardized and Non-Standardized Coefficients, and T-Statistics of Variables Entered in the Regression Equation

Predictor Variable	Unstandardized Coefficients (B)	Standard Error	Standardized Coefficients (Beta)	T-value	p
Constant	5.59	1.20	-	-	-
Class-Related Emotions	2.33	0.71	0.26	3.98	<0.05
Learning-Related Emotions	2.02	0.77	0.20	3.53	<0.05
Test-Related Emotions	2.20	0.92	0.23	3.85	<0.05

Table 3 details the regression coefficients and their statistical significance, offering insights into the specific impact of each predictor variable on academic engagement. Class-Related Emotions had an unstandardized coefficient (B) of 2.33 ($p < 0.05$) and a standardized coefficient (Beta) of 0.26, indicating a positive and significant influence on academic engagement. Learning-Related Emotions also showed a positive impact with a B of 2.02 ($p < 0.05$) and a Beta of 0.20. Test-Related Emotions had a B of 2.20 ($p < 0.05$) and a Beta of 0.23, further confirming the significant predictive power of these emotional dimensions on

engagement. The t-statistics for these predictors (3.98, 3.53, and 3.85, respectively) underscore the robustness of these relationships, reinforcing the critical role of academic emotions in fostering academic engagement among high school students.

4. Discussion and Conclusion

This study aimed to investigate the predictive relationship between academic emotions and academic engagement among high school students, with a particular focus on female students in Estahban city. The findings revealed that

academic emotions significantly predict academic engagement, indicating that both positive and negative emotions related to academic activities play a crucial role in shaping students' engagement levels. Positive academic emotions were found to enhance engagement, whereas negative emotions tended to hinder it. This underscores the importance of understanding and effectively managing academic emotions to foster a conducive learning environment that promotes student participation and commitment.

The results of the present study underscore the pivotal role of academic emotions in predicting academic engagement, aligning with recent research findings that highlight the significant influence of both positive and negative academic emotions on student engagement (Zhang et al., 2021). Positive emotions related to academic activities are seen to bolster engagement, suggesting that fostering a positive emotional climate in educational settings could enhance students' participation and commitment to their studies. Conversely, negative academic emotions may serve as barriers to engagement, highlighting the critical need for strategies to manage and mitigate these adverse effects.

The intricate relationship between academic emotions and engagement is influenced by a myriad of factors, encompassing emotional, motivational, and environmental dimensions. For instance, autonomy-supportive parenting practices have been linked to positive academic emotions and, in turn, higher levels of agentic engagement among students (Bordbar, 2021). This suggests that the home environment and parenting styles play a crucial role in shaping students' emotional experiences and their engagement with academic tasks. Furthermore, the satisfaction of basic psychological needs and emotional intelligence have been identified as mediators in the relationship between academic engagement and success, pointing to the multifaceted nature of engagement and its determinants (Chen & Zhang, 2022).

Educators are also central to this dynamic, with their ability to regulate emotions being shown to significantly impact students' academic emotions and engagement (Wang & Ye, 2021). The emotional climate created by teachers in the classroom can influence students' willingness to engage in learning activities, underscoring the importance of emotion regulation skills among educators. Additionally, academic emotions have been found to mediate the relationship between various educational constructs—such as academic optimism, competency perception, and academic excitement—and student engagement (Kamari et

al., 2021; Sabbaghi et al., 2020). These findings highlight the complex interplay between emotions, perceptions of competence, and engagement, offering insights into potential pathways for enhancing student engagement through emotional and cognitive support.

Parental practices further exemplify the emotional underpinnings of academic engagement, with research indicating that conditional negative regard can lead to academic disengagement, while autonomy support promotes engagement by fostering a sense of choice and interest (Roth et al., 2009). This underscores the nuanced impact of parenting styles on students' emotional experiences and their academic behaviors. In the context of online learning, positive academic emotions, information literacy, and self-directed learning skills have emerged as significant predictors of engagement (Li et al., 2023). This suggests that emotional support and the development of specific skills are crucial for engaging students in online educational contexts.

Despite its contributions, this study is not without limitations. First, the sample was confined to female high school students from a single city, which may limit the generalizability of the findings to other populations or educational contexts. Second, the study relied on self-reported measures for assessing academic emotions and engagement, which might introduce bias or inaccuracies due to social desirability or respondents' subjective interpretation of questions. Lastly, the cross-sectional design of the study prevents the determination of causal relationships between academic emotions and engagement, highlighting the need for longitudinal studies to better understand the dynamics over time.

Future research should aim to address the limitations noted above. Expanding the study to include a more diverse sample that encompasses different geographical regions, educational levels, and includes both male and female students could enhance the generalizability of the findings. Employing a longitudinal design would also be beneficial to examine the causal relationships between academic emotions and engagement over time. Additionally, incorporating qualitative methods or objective measures alongside self-reported data could provide a more nuanced understanding of the complex interplay between emotions and engagement in academic settings.

The findings of this study offer valuable insights for educational practice. Educators and school administrators should consider strategies to foster positive academic emotions and mitigate negative ones among students. This could involve training teachers in emotion regulation

strategies, creating a supportive classroom environment, and integrating activities that promote positive emotions towards learning. Furthermore, parents and caregivers might benefit from guidance on how to support their children's emotional well-being in relation to academic work, emphasizing the importance of autonomy-supportive parenting practices. Lastly, incorporating emotional intelligence and coping strategies into the curriculum could equip students with the skills needed to manage their emotions effectively, thereby enhancing their engagement and overall academic success.

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Declaration of Interest

The authors of the study declare no conflict of interest related to the research.

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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Authors' Contributions

All authors contributed equally in this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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