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Research Article

THE EFFECT OF TEACHER FEEDBACK ON STUDENT SELF-ESTEEM AND ACADEMIC ENGAGEMENT IN SECONDARY EDUCATION

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Abstract

Teacher feedback plays a central role in shaping students' academic experiences, particularly during adolescence, a developmental stage marked by heightened sensitivity to evaluation and identity formation. While prior research has extensively examined the impact of feedback on academic achievement, limited attention has been given to its influence on student self-esteem and academic engagement in secondary education. This study aims to investigate the direct and indirect effects of teacher feedback on students' self-esteem and academic engagement within a structural framework. A quantitative explanatory design was employed involving 512 secondary school students selected through stratified cluster sampling. Data were collected using validated Likert-scale instruments measuring perceived teacher feedback, self-esteem, and multidimensional academic engagement. Structural equation modeling was conducted to test hypothesized relationships among variables. Results indicate that teacher feedback significantly predicts both student self-esteem and academic engagement, with self-esteem partially mediating the relationship between feedback and engagement. The model explains a substantial proportion of variance in engagement outcomes. The findings underscore the importance of constructive and supportive feedback practices in fostering positive self-concept and sustained classroom participation. Strengthening feedback quality may therefore enhance both psychological well-being and academic involvement among secondary school students.

Keywords: academic engagement, secondary education, structural equation modeling, teacher feedback

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INTRODUCTION

Teacher feedback represents one of the most influential pedagogical practices in secondary education, shaping not only students' academic performance but also their psychological development (Gou et al., 2024). Feedback communicates evaluative information about performance, effort, and potential, thereby influencing how students perceive their competence and value within the learning environment. In adolescence, a developmental stage marked by heightened sensitivity to social evaluation, teacher comments may significantly affect self-esteem and patterns of classroom engagement. Educational systems increasingly emphasize formative assessment and constructive feedback strategies, yet their broader psychosocial consequences remain insufficiently synthesized.

Self-esteem constitutes a central component of adolescent identity formation and is closely linked to academic engagement, persistence, and resilience. Students with higher self-esteem tend to demonstrate stronger participation, sustained attention, and willingness to confront challenging tasks. Academic engagement, encompassing behavioral, emotional, and cognitive dimensions, predicts long-term educational outcomes including achievement, retention, and school completion (Zhang et al., 2025). Teacher feedback may operate as a contextual factor that either strengthens or undermines these psychological resources.

Secondary education presents a critical period in which evaluative interactions between teachers and students intensify due to increased academic demands and performance-based grading systems (Twenge, 2013). Classrooms become more structured, assessments more frequent, and comparisons among peers more visible. Feedback delivered in such contexts can function as affirmation, guidance, or discouragement depending on its tone, content, and timing. Systematic exploration of how teacher feedback influences self-esteem and academic engagement during this developmental stage is therefore essential for advancing evidence-based instructional practice.

Despite the recognized importance of teacher feedback, inconsistencies remain in understanding its differential effects on students' psychological and behavioral outcomes. Some studies report that constructive feedback enhances motivation and engagement, while others indicate that critical or evaluative comments may reduce self-confidence (Aue, 2021). Variability in feedback type, delivery style, and contextual factors complicates interpretation of existing findings. Clarification of how specific forms of teacher feedback relate to self-esteem and engagement is needed to address these discrepancies.

Research in secondary education often isolates academic achievement as the primary outcome of feedback practices (Abdelhalim & Alsahil, 2025). Limited attention has been devoted to examining self-esteem as a mediating or parallel psychological outcome. Absence of integrative models linking feedback, self-esteem, and engagement restricts theoretical coherence. Failure to account for these interconnected constructs may obscure the broader impact of teacher feedback beyond performance metrics.

Methodological limitations further contribute to ambiguity in the literature. Many studies rely on cross-sectional surveys that capture perceptions at a single time point. Lack of longitudinal or multi-dimensional assessment reduces the ability to determine directionality and sustained effects (Jussim et al., 1989). Insufficient differentiation between formative, summative, positive, and corrective feedback prevents precise evaluation of which feedback characteristics most strongly influence student self-esteem and engagement in secondary classrooms.

The primary objective of this study is to examine the effect of teacher feedback on student self-esteem and academic engagement in secondary education (Diogo Dias Pocinho, 2010). Emphasis is placed on identifying the direct and indirect pathways through which feedback influences both psychological and behavioral outcomes. The study aims to clarify

whether supportive feedback enhances self-esteem, which in turn promotes greater engagement.

A secondary objective involves differentiating between types of feedback, including formative, evaluative, positive reinforcement, and corrective guidance. Analysis seeks to determine which feedback characteristics are most strongly associated with positive developmental outcomes (Wick et al., 2019). Understanding nuanced variations in feedback practice will enable more precise pedagogical recommendations.

Another objective concerns testing a conceptual model that integrates teacher feedback, student self-esteem, and academic engagement within a single analytical framework (Derbani et al., 2025). Structural modeling will be used to assess relationships among constructs while controlling for demographic and contextual variables. Findings are expected to contribute to theory refinement and to inform evidence-based instructional strategies in secondary education settings.

Existing literature confirms that feedback plays a central role in learning processes, yet few studies systematically examine its psychological consequences during adolescence. Research frequently emphasizes cognitive gains while underexploring emotional and self-concept dimensions (Stephan & Maïano, 2007). Limited empirical attention has been directed toward understanding how feedback interacts with adolescent self-esteem formation.

Prior investigations often treat engagement as a unidimensional construct, neglecting its behavioral, emotional, and cognitive components (Otterpohl et al., 2025). Oversimplified conceptualization may obscure how feedback differentially affects various aspects of engagement. Lack of multidimensional analysis restricts the explanatory depth of previous findings.

Integration of self-esteem within feedback research remains underdeveloped. Studies rarely test mediation models that position self-esteem as an intermediary variable between teacher practices and engagement outcomes. Absence of comprehensive analytical frameworks creates a clear research gap (Oleksiyenko et al., 2019). Addressing this limitation will advance theoretical integration and empirical precision in understanding teacher–student interaction effects.

The proposed study offers conceptual novelty by explicitly linking teacher feedback to student self-esteem and academic engagement within a unified structural model (De Jonge et al., 2025). Simultaneous examination of psychological and behavioral outcomes extends beyond traditional achievement-focused research. The study advances understanding of feedback as a multidimensional influence shaping both internal self-perception and observable classroom participation.

Methodological innovation is reflected in the use of advanced statistical modeling to test direct and indirect effects among constructs. Differentiation of feedback types allows for granular analysis of pedagogical practice (Badia Martín & Devant Cerezo, 2024). Integration of multidimensional engagement measures strengthens empirical validity and enhances interpretative clarity.

Justification for the study derives from the critical developmental stage of secondary education, where teacher interactions significantly shape student identity and academic trajectory. Evidence-based guidance on effective feedback strategies can support positive self-esteem development and sustained engagement (Wang, 2024). Advancement of knowledge in this area holds practical implications for teacher training, classroom practice, and educational policy focused on holistic student development.

RESEARCH METHOD

The following sections detail the systematic approach used to examine the psychological and behavioral pathways through which teacher feedback influences student development.

Research Design

This study employed a quantitative explanatory design using a cross-sectional correlational framework to investigate how teacher feedback affects student self-esteem and academic engagement (Adelman & McNamara, 2026). Structural equation modeling (SEM) was applied to test both direct and indirect pathways, allowing for the simultaneous analysis of multiple latent variables. This design was selected to identify whether self-esteem serves as a mediating variable between pedagogical practices and student engagement (Mahamod et al., 2026). Prior to inferential analysis, the model's robustness was verified by testing assumptions of normality, multicollinearity, and homoscedasticity.

Research Target/Subject

The primary objective of this research is to assess the extent to which teacher feedback predicts student academic engagement, both directly and through the mechanism of self-esteem. The study targets the identification of which specific types of feedback—such as formative or corrective—have the most significant impact on adolescent psychological outcomes. By controlling for prior achievement and demographic factors, the research aims to provide a clear explanation of how instructional communication shapes student behavioral and cognitive engagement.

The population consisted of secondary school students in Grades 9 to 11. Using stratified cluster sampling, a sample of 512 students (aged 14–17) was selected to represent various socioeconomic and institutional categories. Inclusion criteria ensured that all subjects were actively receiving verbal or written feedback in their current academic track. A power analysis was conducted to confirm that the sample size was adequate to detect meaningful effect sizes within the structural model.

Research Procedure

Procedures followed strict ethical guidelines, beginning with institutional approval and the acquisition of informed consent from parents and students (Khan & Pandey, 2026). Questionnaires were administered in classroom settings under researcher supervision to maintain standardized conditions. Participants were assured of anonymity, and their responses were coded to protect confidentiality. Post-collection, the surveys were screened for missing data and inconsistencies before being entered into specialized statistical software for path analysis.

Instruments, and Data Collection Techniques

Data were gathered through a battery of validated instruments. Teacher feedback was measured using a multidimensional feedback perception scale, while self-esteem was assessed using a standardized inventory for adolescents (Raufelder et al., 2026). Academic engagement was quantified through a scale capturing behavioral, emotional, and cognitive dimensions. To ensure the accuracy of the measurements, Confirmatory Factor Analysis (CFA) was conducted to verify construct validity, and reliability was confirmed using Cronbach's alpha and composite reliability coefficients (>0.70).

Data Analysis Technique

The study utilized Structural Equation Modeling (SEM) as the primary analytical technique. This allowed the researcher to evaluate the "fit" of the hypothesized model against the actual data. Descriptive statistics were used to summarize demographic variables, while the structural model was used to calculate path coefficients—numerical values that represent the strength of the relationships between feedback, self-esteem, and engagement (Malgoubri, 2026). By using SEM, the study was able to account for measurement error, providing a more precise understanding of the indirect psychological pathways involved.

RESULTS AND DISCUSSION

Descriptive statistics were calculated to summarize students' perceptions of teacher feedback, levels of self-esteem, and degrees of academic engagement. The final sample consisted of 512 secondary school students. The mean score for overall teacher feedback perception was 3.74 (SD = 0.52) on a five-point Likert scale. Self-esteem demonstrated a mean of 3.61 (SD = 0.57), while academic engagement showed a mean of 3.68 (SD = 0.49). Behavioral engagement recorded the highest subdimension mean (M = 3.72, SD = 0.51), followed by emotional engagement (M = 3.66, SD = 0.54) and cognitive engagement (M = 3.64, SD = 0.53).

Table 1. Descriptive Statistics of Teacher Feedback, Self-Esteem, and Academic Engagement

Variable	Mean	Standard Deviation	Minimum	Maximum
Teacher Feedback	3.74	0.52	2.10	4.85
Self-Esteem	3.61	0.57	2.00	4.90
Academic Engagement	3.68	0.49	2.25	4.88
Behavioral Engagement	3.72	0.51	2.30	4.92
Emotional Engagement	3.66	0.54	2.10	4.86
Cognitive Engagement	3.64	0.53	2.15	4.83

Observed mean scores indicate that students generally perceived teacher feedback as moderately positive and constructive. Distribution patterns show relatively balanced responses across engagement dimensions, suggesting that teacher feedback may influence multiple aspects of student involvement in classroom activities. Standard deviation values reflect moderate variability, indicating the presence of diverse student experiences in feedback reception and psychological outcomes.

Higher mean scores in behavioral engagement imply that teacher feedback may more directly affect observable participation, such as attentiveness and task completion. Slightly lower but comparable means in emotional and cognitive engagement suggest that internal engagement processes are also influenced, though potentially through mediated pathways such as self-esteem. Overall data patterns provide preliminary evidence supporting the hypothesized associations.

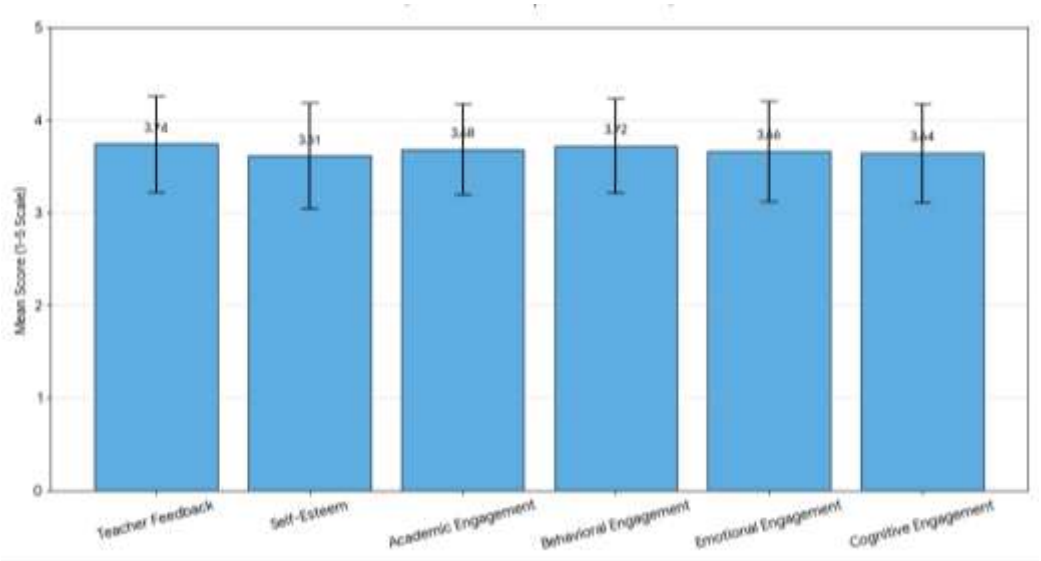

Figure 1. Descriptive Statistics of Student Variables

Pearson correlation analyses were conducted to explore associations among teacher feedback, self-esteem, and academic engagement. Teacher feedback demonstrated a significant

positive correlation with self-esteem ($r = .46$, $p < .001$) and academic engagement ($r = .52$, $p < .001$). Self-esteem also showed a strong positive correlation with academic engagement ($r = .58$, $p < .001$). Subdimension analysis revealed that feedback was most strongly associated with behavioral engagement ($r = .49$, $p < .001$).

Table 2. Correlations Among Teacher Feedback, Self-Esteem, and Academic Engagement

Variable	1	2	3
1. Teacher Feedback	—		
2. Self-Esteem	.46***	—	
3. Academic Engagement	.52***	.58***	—

***p < .001

Structural equation modeling was employed to test the hypothesized relationships among variables. The measurement model demonstrated satisfactory fit indices ($\chi^2/df = 2.11$; CFI = .94; TLI = .93; RMSEA = .049). Teacher feedback significantly predicted self-esteem ($\beta = .48$, $p < .001$) and academic engagement ($\beta = .34$, $p < .001$). Self-esteem also significantly predicted academic engagement ($\beta = .41$, $p < .001$).

Indirect effect analysis revealed that self-esteem partially mediated the relationship between teacher feedback and academic engagement (indirect $\beta = .20$, $p < .01$). The structural model explained 23% of variance in self-esteem and 46% of variance in academic engagement. Results confirm both direct and mediated effects within the proposed framework.

Path analysis indicates that teacher feedback functions as a foundational pedagogical influence shaping both psychological and behavioral outcomes. Direct effects on engagement suggest that students respond immediately to evaluative and supportive teacher communication. Indirect effects through self-esteem demonstrate that internal self-perception strengthens the magnitude of engagement responses.

Subdimension analysis shows that behavioral engagement receives the strongest direct influence from teacher feedback, whereas emotional and cognitive engagement are more strongly associated with self-esteem. Relationship patterns highlight the multifaceted role of teacher feedback in influencing classroom dynamics. Integrated effects underscore the interconnected nature of psychological and engagement processes.

A focused subgroup analysis was conducted involving 40 students reporting exceptionally high perceptions of constructive teacher feedback. This subgroup displayed a mean self-esteem score of 4.12 and academic engagement mean of 4.18, significantly above the overall sample averages. Behavioral engagement within this group reached 4.25, reflecting heightened participation and task commitment.

Another subgroup of 35 students reporting low-quality or predominantly critical feedback exhibited a mean self-esteem score of 3.02 and engagement mean of 3.11. Behavioral and emotional engagement were notably reduced, suggesting decreased classroom involvement. Differences between groups were statistically significant ($p < .01$), reinforcing the impact of feedback perception on student outcomes.

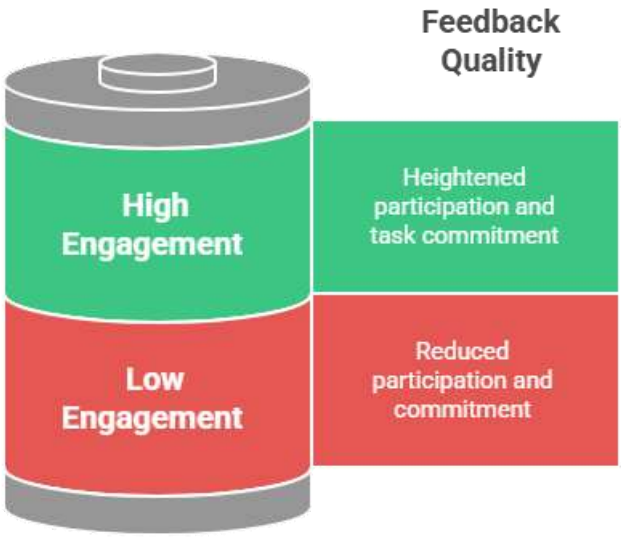

Figure 2. Student Engagement Levels Vary Based on Feedback Quality

Students receiving constructive and autonomy-supportive feedback reported feeling valued and capable within the classroom context. Positive reinforcement appeared to strengthen confidence and encourage sustained effort in academic tasks. Observed engagement behaviors included active participation in discussions and consistent assignment submission.

Students exposed primarily to critical or unclear feedback demonstrated lower confidence and reduced classroom participation. Self-reported feelings of discouragement and hesitation to contribute were evident. These patterns illustrate how feedback tone and clarity may influence psychological resilience and engagement behavior in secondary education.

Findings provide empirical support for the hypothesis that teacher feedback significantly influences student self-esteem and academic engagement. Constructive and supportive feedback enhances both psychological well-being and observable participation in classroom activities. Mediation results confirm that self-esteem serves as a key mechanism through which feedback shapes engagement.

Evidence suggests that teacher feedback operates as both a direct instructional tool and an indirect psychological influence. Effective feedback strategies may foster positive academic identities and sustained engagement in secondary education. Results contribute to understanding how pedagogical communication practices shape adolescent development within educational settings.

The findings of this study demonstrate that teacher feedback exerts a significant positive effect on student self-esteem and academic engagement in secondary education. Structural equation modeling confirmed that constructive teacher feedback directly predicts higher levels of student engagement and indirectly influences engagement through enhanced self-esteem. The model explained a substantial proportion of variance in academic engagement, indicating the centrality of pedagogical communication in shaping student outcomes.

Teacher feedback was found to significantly predict student self-esteem, suggesting that evaluative and formative comments function not only as instructional tools but also as psychological affirmations. Students who perceived feedback as clear, supportive, and improvement-oriented reported stronger beliefs in their own academic competence. Elevated self-esteem was subsequently associated with higher behavioral, emotional, and cognitive engagement.

Direct effects of teacher feedback on engagement remained significant even after accounting for the mediating role of self-esteem. Behavioral engagement appeared most strongly influenced by feedback, reflecting the immediate impact of teacher responses on student participation and task involvement. Emotional and cognitive engagement demonstrated

stronger links to internal self-perception, underscoring the mediating mechanism identified in the model.

Subgroup analysis reinforced these patterns by revealing that students who experienced constructive feedback exhibited markedly higher engagement and self-esteem compared to those perceiving predominantly critical or unclear feedback. Observed differences across groups highlight the practical consequences of feedback quality. Findings collectively confirm that teacher feedback operates as both a psychological and behavioral catalyst in secondary education contexts.

The present findings align with social cognitive theory, which emphasizes the role of social feedback in shaping self-efficacy and subsequent behavior. Prior research has consistently demonstrated that positive reinforcement enhances student motivation and participation. The current study extends this literature by empirically confirming self-esteem as a mediating variable within secondary education settings.

Existing studies have often focused on the academic achievement outcomes of feedback rather than its psychosocial implications. The current results broaden the scope of feedback research by highlighting its influence on adolescent self-concept development. Integration of engagement and self-esteem within a single analytical model contributes to a more comprehensive understanding of feedback dynamics.

Some previous investigations have reported limited or inconsistent effects of feedback on engagement, particularly when feedback is perceived as evaluative rather than formative. Findings from this study suggest that the quality and tone of feedback significantly determine its psychological impact. Differences across studies may be attributed to variation in feedback type and measurement approaches.

Longitudinal and structural modeling approaches remain relatively underutilized in feedback research within secondary education. The use of structural equation modeling in this study strengthens causal inference and clarifies indirect pathways. Methodological advancement likely contributed to detecting stronger mediated effects than those identified in earlier correlational analyses.

The results indicate that teacher feedback functions as a critical developmental influence during adolescence. Secondary education represents a period of heightened sensitivity to evaluative judgments, making teacher comments particularly impactful on students' self-perceptions. Positive feedback appears to reinforce academic identity, whereas negative or unclear feedback may undermine confidence.

Patterns observed in the mediation analysis suggest that engagement is not solely a behavioral response to instructional practice. Psychological processes such as self-esteem shape how students internalize and respond to teacher communication. Classroom engagement therefore reflects a complex interaction between external feedback and internal self-concept.

Variability in student responses underscores the importance of perceived feedback quality. Students interpret feedback through personal and contextual lenses, which may amplify or diminish its effects. Recognition of these interpretative processes highlights the nuanced role of teacher communication in shaping student development.

Findings also suggest that classroom climate is indirectly influenced by feedback practices (Garbett et al., 2021). Supportive feedback may cultivate a learning environment characterized by trust, participation, and persistence. Negative evaluative interactions may contribute to disengagement and reduced academic confidence over time.

Educational practitioners should prioritize formative and autonomy-supportive feedback strategies to enhance both self-esteem and engagement. Professional development programs can equip teachers with communication techniques that balance constructive criticism with affirmation of student capability (Schoreit & Kuhn, 2022). Deliberate attention to feedback phrasing and tone may foster stronger psychological resilience among adolescents.

School policies should integrate psychosocial considerations into assessment frameworks (Stern & Backhouse, 2011). Evaluation systems that emphasize growth-oriented feedback rather than solely performance comparison may promote healthier academic identities. Implementation of structured feedback guidelines can standardize supportive practices across classrooms.

Curriculum designers may incorporate reflective feedback loops that encourage student self-assessment alongside teacher comments. Encouraging students to interpret feedback as developmental guidance rather than judgment may strengthen internalization processes (Burnett & Howard, 2002). Engagement-focused instructional planning can further reinforce positive feedback effects.

Educational leaders should recognize feedback as a central component of student well-being initiatives (Gholamrezaee & Ghanizadeh, 2018). Evidence linking feedback to self-esteem suggests that instructional communication plays a preventive role in mitigating disengagement. Strategic emphasis on supportive feedback may contribute to improved retention and academic persistence.

Adolescents in secondary education often rely heavily on social validation from authority figures. Teacher feedback serves as a salient evaluative signal that shapes perceptions of competence and belonging (Taruki, 1992). Positive reinforcement likely enhances self-esteem by affirming academic capability.

Cognitive appraisal processes may explain the mediating role of self-esteem (Sara et al., 2026). Students interpret teacher comments as indicators of personal worth and competence, which influence emotional reactions and motivation. Strengthened self-esteem promotes willingness to participate and persist in challenging tasks.

Behavioral engagement may respond more immediately to feedback due to its observable and action-oriented nature. Students receiving clear guidance are more likely to adjust behavior and effort accordingly (Santoso et al., 2026). Emotional and cognitive engagement may require internal processing before manifesting in sustained learning strategies.

Feedback that emphasizes improvement rather than deficiency may activate growth-oriented beliefs (Hagos, 2026). Students perceiving feedback as supportive may adopt mastery goals rather than avoidance strategies. Psychological reinforcement of competence likely explains the observed pathways linking feedback to engagement.

Future research should examine longitudinal effects of teacher feedback on self-esteem development across multiple academic years. Extended observation may clarify whether early feedback experiences produce lasting psychological patterns (Thygesen et al., 2026). Comparative studies across cultural and institutional contexts may also reveal contextual moderators.

Experimental designs manipulating feedback type could provide stronger causal evidence (Cabarcas-Fuentes & Rodríguez-Chueca, 2026). Controlled interventions comparing formative and summative feedback approaches may validate practical strategies derived from current findings. Mixed-method research incorporating qualitative interviews could deepen understanding of student interpretations of feedback.

Exploration of moderating variables such as gender, academic track, and prior achievement may refine predictive models. Differences in sensitivity to feedback could influence the strength of psychological outcomes (Korres, 2026). Inclusion of additional constructs such as resilience and academic anxiety may further enrich explanatory frameworks.

Educational systems should consider integrating structured feedback training into teacher preparation programs (Avramidis et al., 2026). Ongoing monitoring of feedback practices and student psychosocial indicators may inform continuous improvement. Advancement of research in this domain remains essential for promoting holistic development in secondary education.

CONCLUSION

The most significant finding of this study is the confirmation that teacher feedback exerts both direct and indirect effects on academic engagement through the mediating role of student self-esteem in secondary education. Constructive and autonomy-supportive feedback significantly enhanced students' self-perceptions of competence, which in turn strengthened their behavioral, emotional, and cognitive engagement in classroom activities. The mediation analysis revealed that self-esteem functions as a central psychological mechanism translating instructional communication into sustained engagement. This integrative pathway distinguishes the present findings from prior research that predominantly examined feedback effects solely on academic performance without accounting for adolescent self-concept development.

The primary contribution of this research lies in its conceptual and methodological integration of teacher feedback, self-esteem, and academic engagement within a unified structural model. Conceptually, the study advances understanding of feedback as a multidimensional pedagogical influence that shapes both psychological and behavioral outcomes. Methodologically, the application of structural equation modeling enabled the examination of direct and mediated relationships with greater analytical precision than traditional correlational designs. The study therefore enriches theoretical discourse on instructional communication and adolescent development while offering empirically grounded insights for educational practice.

Several limitations should be acknowledged. The cross-sectional design restricts causal inference and limits conclusions regarding long-term developmental trajectories. Reliance on self-reported measures may introduce response bias despite acceptable reliability and validity indicators. Future research should employ longitudinal and experimental designs to establish stronger causal evidence and explore contextual moderators such as cultural background, school climate, and feedback delivery style. Expanded investigation across diverse educational settings would further clarify the generalizability and developmental implications of teacher feedback in secondary education.

AUTHOR CONTRIBUTIONS

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; In-vestigation.

Author 3: Data curation; Investigation.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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