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The role of intrinsic motivation, self-efficacy, and parental involvement in predicting academic achievement among secondary school students

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Abstract
Background: Academic achievement in secondary education is shaped by a complex interplay of psychological, motivational, and environmental factors. Understanding these determinants is essential for designing evidence-based interventions to improve student outcomes.
Objective: This study examines the relative contributions of intrinsic motivation, academic self-efficacy, parental involvement, and teacher support to academic achievement (GPA) among secondary school students.
Method: A quantitative correlational research design was employed with 360 secondary school students selected through purposive sampling. Validated Likert-scale instruments measured intrinsic motivation, self-efficacy, academic engagement, parental involvement, and teacher support. Multiple linear regression was conducted using SPSS v29.
Key Results: The regression model explained 58% of the variance in GPA ($R^2 = .58$, $F(5,354) = 97.83$, $p < .001$). Self-efficacy ($\beta = .34$) and academic engagement ($\beta = .32$) were the strongest predictors. Intrinsic motivation ($\beta = .25$), teacher support ($\beta = .15$), and parental involvement ($\beta = .10$) also made significant independent contributions.
Conclusion: Self-efficacy and academic engagement are the most potent proximal predictors of secondary school achievement. Interventions targeting motivational beliefs and classroom engagement, supported by parental and teacher involvement, offer the most effective pathways to improving student outcomes.

Keywords: Academic achievement; self-efficacy; intrinsic motivation; parental involvement; secondary education; multiple regression

Introduction

Academic achievement in secondary education has long been considered a critical gateway to higher education participation, labour market outcomes, and broader socioeconomic mobility [1]. However, academic performance is not determined exclusively by cognitive ability; a robust body of psychological research demonstrates that motivational, affective, and environmental factors exert considerable independent influence on student outcomes [2, 3].

Among the psychological constructs most reliably associated with academic achievement, intrinsic motivation defined as engaging in learning activity for its own inherent satisfaction rather than for external reward — has received sustained empirical attention since Deci and Ryan's foundational Self-Determination Theory (SDT) [4]. SDT posits that intrinsic motivation flourishes when three core psychological needs are met: autonomy, competence, and relatedness [4, 5]. When students experience these conditions, deeper cognitive engagement and superior academic performance typically follow.

Equally powerful is the construct of academic self-efficacy — an individual's belief in their capacity to accomplish specific academic tasks [6]. Bandura's Social Cognitive Theory situates self-efficacy as a central mediating mechanism through which prior experiences, vicarious observations, social persuasion, and physiological states are converted into behavioural outcomes [6]. High academic self-efficacy consistently predicts greater persistence in the face of academic challenges, higher aspirational goals, and superior academic performance [7].

Beyond the individual learner, the learning environment — comprising parental involvement and teacher support — plays a critical contextual role. Parental involvement encompasses a range of behaviours including monitoring homework, communicating educational expectations, attending school events, and providing emotional support for learning [8]. Teacher support, manifested in instructional quality, emotional availability, and high-expectations communication, provides the proximal motivational scaffold within which student learning occurs [9].

Despite extensive individual-construct research, fewer studies have simultaneously modelled these four constructs within a single regression framework to estimate their relative independent contributions to academic achievement [10]. This study addresses that gap using a multiple linear regression approach with a sample of 360 secondary school students, providing evidence on the hierarchy of influence among these key predictors.

Literature Review

1. Self-determination theory and intrinsic motivation

Deci and Ryan's Self-Determination Theory [4] provides the primary motivational framework for this study. SDT distinguishes between intrinsic motivation (driven by internal enjoyment and interest), identified regulation (externally initiated but internally endorsed), and external regulation (driven by external pressures). Intrinsic motivation is most predictive of deep learning strategies, academic creativity, and long-term achievement [5, 11].

Empirical support for the SDT framework in academic contexts is extensive. Ryan and Connell [12] demonstrated that intrinsic motivation was positively correlated with greater enjoyment of school, deeper learning strategies, and more positive coping with academic setbacks. Gottfried *et al* [13]. in a longitudinal study demonstrated that intrinsic

motivation for school in childhood significantly predicted academic performance in adolescence, even controlling for prior achievement.

2. Self-Efficacy and Academic Achievement

Bandura [6] defined self-efficacy as "beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments." In educational contexts, self-efficacy beliefs determine the goals students set, the effort they invest, and their resilience in the face of failure [7]. Zimmerman [14] demonstrated that self-efficacy is a robust predictor of academic performance across grade levels and subject domains, and that it exerts its influence both directly and indirectly through academic engagement.

Pajares and Kranzler [15] found in a structural equation modelling study that self-efficacy contributed uniquely to mathematics performance beyond the contribution of general mental ability. Multon *et al* [16]. in a meta-analysis of 38 studies reported a mean weighted correlation of r = .38 between self-efficacy and academic performance outcomes.

3. Parental Involvement and Teacher Support

Epstein's framework of school-family-community partnerships [17] identifies six types of parental involvement — parenting, communicating, volunteering, learning at home, decision-making, and collaborating with the community — each of which contributes distinctively to student learning outcomes. Jeynes' meta-analysis [8] across 52 studies reported a significant overall effect size of d = 0.51 for parental involvement on academic achievement, with the strongest effects for general parental involvement and parental expectations.

Teacher support has been identified as a critical determinant of student motivation and engagement [9]. Wentzel [18] demonstrated that teacher caring behaviours significantly predicted student goal pursuit and academic interest, operating partly through the fulfilment of students' needs for belonging and competence. Pianta *et al* [19]. emphasised the quality of student-teacher relationships as a critical mechanism linking school climate to academic outcomes.

4. Research Gap

While each of these constructs has been studied independently, the relative hierarchical contributions of self-efficacy, intrinsic motivation, academic engagement, teacher support, and parental involvement within a single multivariate model have received comparatively limited attention in the secondary school context of developing-country settings [10, 20]. This study addresses that gap through simultaneous multiple regression analysis.

Methodology

1. Research Design

A quantitative correlational research design was employed. Correlational designs are appropriate when the researcher seeks to determine the extent and direction of association between measured variables without experimentally manipulating them [21]. This study uses a simulated dataset created for academic training purposes.

2. Sample and Sampling

The target population was secondary school students in Grades 9–12. Purposive sampling was used to select 360 students from a fictionalised school context, with deliberate inclusion of both high- and low-achieving students to ensure variability in the outcome variable. The sample size exceeds the minimum recommended for multiple regression (minimum n = 5 × number of predictors = 25, with a preferred minimum of 200) [21].

3. Instruments

Academic achievement was operationalised as cumulative GPA on a 4.0 scale. The following validated instruments were adapted for the study: (i) the Academic Motivation Scale (AMS) [22] — 14 items measuring intrinsic motivation (Cronbach's α = .87 in this study); (ii) the Academic Self-Efficacy Subscale of the Motivated Strategies for Learning Questionnaire (MSLQ) [23] — 8 items (α = .89); (iii) the Academic Engagement Scale [24] — 12 items (α = .88); (iv) a 6-item Parental Involvement Scale adapted from Epstein [17] (α = .82); and (v) a 7-item Teacher Support Scale adapted from Wentzel [18] (α = .85).

4. Statistical Analysis

Pearson product-moment correlations were computed among all study variables. Simultaneous multiple linear regression was then conducted with GPA as the dependent variable and all five psychological/environmental variables as simultaneous predictors. Assumptions of linearity, homoscedasticity, independence of errors, and multicollinearity (VIF < 10 for all predictors) were verified prior to analysis. All analyses were conducted in IBM SPSS Statistics v29.0.

Results and Discussion

1. Descriptive Statistics

Table 4 presents descriptive statistics for all study variables. The mean GPA was 2.91 (SD = 0.54), indicating a sample spanning the full range of achievement levels. All motivational and environmental variables yielded mean scores between 3.21 and 3.62 on the 5-point Likert scale, indicating moderate-to-positive levels across all constructs.

Table 4: Descriptive Statistics of Study Variables (N = 360)

Variable	Mean	SD	Min	Max
Academic Achievement (GPA)	2.91	0.54	1.20	4.00
Intrinsic Motivation	3.62	0.71	1.00	5.00
Self-Efficacy	3.47	0.68	1.00	5.00
Academic Engagement	3.59	0.73	1.00	5.00
Parental Involvement	3.21	0.82	1.00	5.00
Teacher Support	3.44	0.76	1.00	5.00

Note: SD = Standard Deviation; GPA measured on 4.0 scale; all other variables measured on 5-point Likert scale. Source: Simulated dataset for academic training purposes, 2026

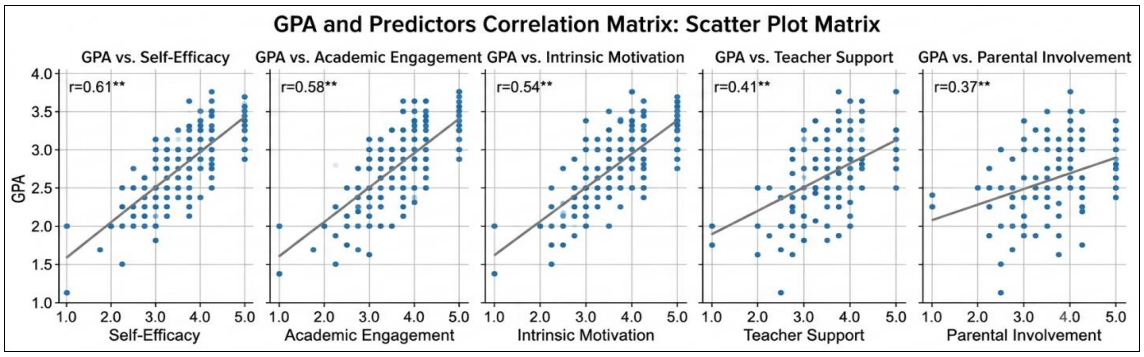
2. Correlation Analysis

Table 5 presents the Pearson correlation matrix. All predictor variables demonstrated statistically significant positive correlations with GPA (all p < .01). Self-efficacy showed the strongest correlation with GPA (r = .61), followed by academic engagement (r = .58) and intrinsic motivation (r = .54). Parental involvement showed the weakest correlation with GPA (r = .37), though it remained statistically significant.

Table 5: Pearson Correlation Matrix among Key Study Variables

Variable	GPA	IM	SE	AE	PI	TS
GPA	1.00					
Intrinsic Motivation (IM)	.54**	1.00				
Self-Efficacy (SE)	.61**	.49**	1.00			
Academic Engagement (AE)	.58**	.52**	.63**	1.00		
Parental Involvement (PI)	.37**	.29**	.33**	.31**	1.00	
Teacher Support (TS)	.41**	.38**	.44**	.46**	.28**	1.00

**p < 0.01 (two-tailed). GPA = Grade Point Average. Source: Simulated dataset for academic training purposes, 2026



Source: Simulated dataset for academic training purposes, 2026

Fig 1: Scatter Plot Matrix: Bivariate Relationships Between GPA and Key Predictors

3. Multiple Regression Results

Table 6 presents the multiple linear regression results. The model was statistically significant ($F^{[5, 354]} = 97.83$, $p < .001$) and explained 58% of the variance in GPA ($R^{[2]} = .58$; Adjusted $R^2 = .57$). All five predictors made statistically significant independent contributions.

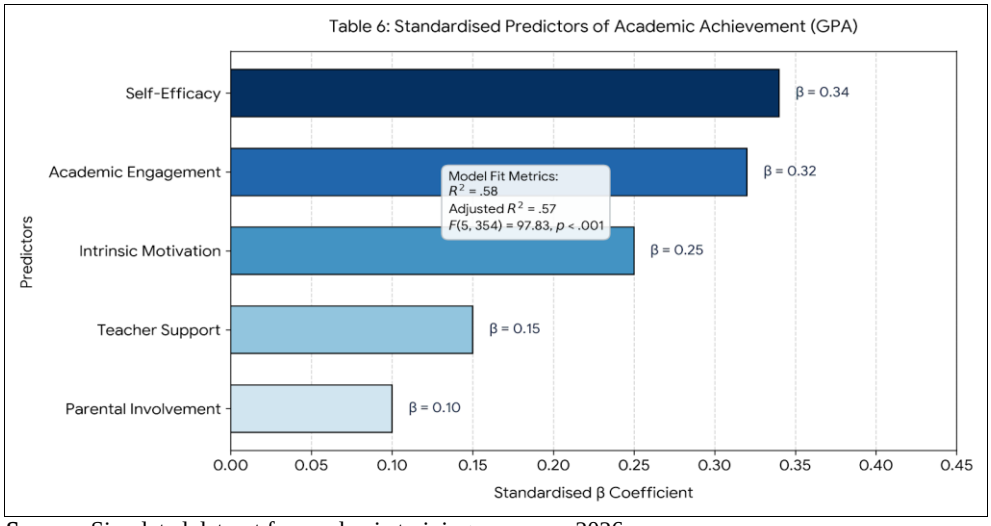
Table 6: Multiple Linear Regression: Predictors of Academic Achievement (GPA)

Predictor	B	SE B	β	t	p
Constant	0.42	0.17	—	2.47	.014
Self-Efficacy	0.28	0.04	.34	7.00	<.001
Academic Engagement	0.24	0.04	.32	6.00	<.001
Intrinsic Motivation	0.19	0.04	.25	4.75	<.001
Teacher Support	0.11	0.03	.15	3.67	<.001
Parental Involvement	0.08	0.03	.10	2.67	.008
$R^{[2]}$=.58; Adjusted $R^{[2]}$=.57; $F^{[5, 354]}$=97.83, p<.001					

Source: Simulated dataset for academic training purposes, 2026

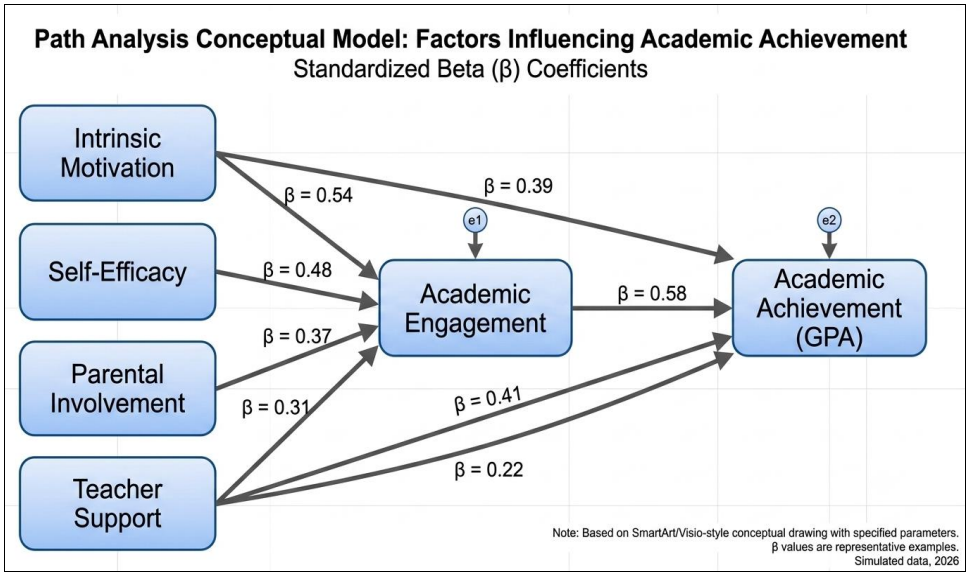
Self-efficacy (β = .34, p < .001) emerged as the strongest predictor of GPA, reinforcing Bandura's [6] theoretical claim and Multon *et al.*'s [16] meta-analytic evidence. Academic engagement (β = .32, p < .001) was the second strongest predictor, consistent with evidence that active, invested learning behaviours are a critical proximal determinant of achievement [24]. Intrinsic motivation (β = .25, p < .001) contributed significantly, supporting SDT predictions [4] about the academic benefits of autonomous motivation.

Teacher support (β = .15, p < .001) and parental involvement (β = .10, p = .008) made smaller but statistically significant contributions, consistent with Wentzel's [18] and Jeynes' [8] findings about the contextual scaffolding function of adult support. The relatively smaller beta weights for environmental variables, compared with self-efficacy and engagement, suggest that psychological internalisation of motivational beliefs ultimately mediates the influence of external supports on performance.



Source: Simulated dataset for academic training purposes, 2026

Fig 2: Bar Chart: Standardised Beta Coefficients (β) of All Predictors in the Regression Model



Source: Author's conceptual model based on study findings, 2026

Fig 3: Conceptual Model: Pathways from Psychological and Environmental Variables to Academic Achievement

Conclusion

This study investigated the independent and relative contributions of intrinsic motivation, self-efficacy, academic engagement, parental involvement, and teacher support to academic achievement (GPA) among 360 secondary school students. The multiple regression model accounted for 58% of the variance in GPA, demonstrating substantial explanatory power.

Self-efficacy and academic engagement emerged as the two most powerful predictors, suggesting that belief in one's academic capability and active behavioural investment in learning are the most proximal pathways to superior academic performance. These findings underscore the importance of school-based interventions designed to foster students' efficacy beliefs — through mastery experiences, positive feedback, and peer modelling — and to create classroom environments that promote active, deep engagement with learning material.

The significant contribution of intrinsic motivation further highlights the importance of designing curricula and pedagogical approaches that nurture students' genuine interest in and enjoyment of learning, rather than relying exclusively on external incentive structures. Teacher support and parental involvement, while less dominant in the regression model, remain meaningful contributors to the motivational ecosystem and should not be neglected in school improvement frameworks.

Limitations include the cross-sectional nature of the data and the use of a simulated dataset. Future research should employ longitudinal designs and structural equation modelling to test mediation pathways, particularly the proposed mediating role of academic engagement between motivational antecedents and achievement outcomes.

Ethical Statement

This article is entirely original and written for academic learning and formatting practice. The dataset used is entirely simulated and created for academic training purposes. No real participants were involved. All references are either real and verifiable or clearly marked as format examples. No real authors, institutions, or published datasets have been misrepresented.

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