

Achievement Motivation and Academic Performance among Middle School and High School Student-Athletes: Mediating Role of Academic Self-Efficacy

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Abstract : Student-athletes are required to balance the demands in two separate yet equally important domains: sports and academics. This study investigates the mediating role of academic self-efficacy in the relationship between achievement motivation and academic performance among middle and high school student-athletes in Bandung, Indonesia. A cross-sectional correlational design was used to collect data from 60 valid student-athletes across various sports. The achievement motivation was measured through the employment of an adapted Hermans scale, academic self-efficacy with the adapted Academic Self-Efficacy Scale (TASES), academic performance through a self-reported semester report-card grades and mediation was tested using bias-corrected bootstrapping (5,000 resamples). Achievement motivation significantly predicted academic self-efficacy ($\beta = 0.58, p < .001$), and academic self-efficacy significantly predicted academic performance ($\beta = .47, p < 0.001$). The indirect effect was significant ($\beta = .27, 95\% CI [.12, .50]$) while the direct effect became non-significant, indicating full mediation. Academic self-efficacy fully mediated the motivation-performance relationship, suggesting that competitive athletic experience enhances academic outcomes primarily by strengthening students' academic self-belief.

Keywords : Achievement Motivation; Academic Self-Efficacy; Academic Performance; Student-Athletes; Middle School; High School.

Abstrak : Atlet pelajar dituntut untuk menyeimbangkan tuntutan dalam dua ranah yang berbeda namun sama pentingnya, yaitu olahraga dan akademik. Penelitian ini bertujuan untuk menguji peran mediasi efikasi diri akademik dalam hubungan antara motivasi berprestasi dan kinerja akademik pada atlet pelajar tingkat sekolah menengah pertama dan sekolah menengah atas di Bandung, Indonesia. Penelitian ini menggunakan desain korelasional potong lintang dengan pengumpulan data dari 60 atlet pelajar yang valid dari berbagai cabang olahraga. Motivasi berprestasi diukur menggunakan adaptasi skala Hermans, efikasi diri akademik diukur menggunakan adaptasi Academic Self-Efficacy Scale (TASES), sedangkan kinerja akademik diukur melalui nilai rapor semester yang dilaporkan secara mandiri. Analisis mediasi dilakukan menggunakan metode bias-corrected bootstrapping dengan 5.000 pengambilan sampel ulang. Motivasi berprestasi secara signifikan memprediksi

efikasi diri akademik ($\beta = 0,58$, $p < 0,001$), dan efikasi diri akademik secara signifikan memprediksi kinerja akademik ($\beta = 0,47$, $p < 0,001$). Pengaruh tidak langsung menunjukkan hasil yang signifikan ($\beta = 0,27$, 95% CI [0,12, 0,50]), sedangkan pengaruh langsung menjadi tidak signifikan, yang menunjukkan adanya mediasi penuh. Efikasi diri akademik sepenuhnya memediasi hubungan antara motivasi dan kinerja akademik, menunjukkan bahwa pengalaman dalam olahraga kompetitif meningkatkan hasil akademik terutama melalui penguatan keyakinan siswa terhadap kemampuan akademiknya.

Kata Kunci : Motivasi Berprestasi; Efikasi Diri Akademik; Kinerja Akademik; Atlet Pelajar; Sekolah Menengah Pertama; Sekolah Menengah Atas

INTRODUCTION

Student-athletes represent a unique population that must simultaneously navigate the demands of two highly competitive domains: athletic achievement and academic success. Globally, adolescent athletes are increasingly expected to achieve excellence in sports while maintaining satisfactory academic outcomes, creating a complex developmental challenge that requires effective psychological regulation and adaptive strategies. Intensive training schedules, frequent competitions, physical exhaustion, and academic responsibilities often create substantial cognitive and emotional demands for student-athletes. Therefore, understanding how experiences and psychological resources developed in the athletic domain influence academic outcomes has become an important concern within educational psychology and sport psychology. A fundamental question that remains is whether the motivation developed through competitive sport can be transferred into academic settings and, more importantly, what psychological mechanisms facilitate this transfer.

One of the psychological constructs considered central to explaining this process is achievement motivation. Achievement motivation refers to an individual's tendency to strive for excellence, demonstrate competence, overcome challenges, and achieve personally or socially defined standards of success (McClelland, 1987; Elliot & Church, 1997). In the context of student-athletes, achievement motivation developed through structured training, competitive experiences, goal setting, and performance evaluation may contribute to the development of adaptive learning behaviors. Athletes who consistently experience achievement-oriented environments may develop persistence, discipline, and a mastery-oriented mindset, which potentially extend beyond sports participation into academic activities. Previous studies have demonstrated that achievement motivation is associated with academic outcomes among collegiate athletes (Han et al., 2022) and influences academic performance through psychological mechanisms such as self-efficacy among university students involved in sports (Li et al., 2022b). Furthermore, a recent multilevel meta-analysis involving 47 longitudinal studies among primary and secondary school students confirmed a reciprocal relationship between motivation and academic achievement, although the magnitude of the relationship varies depending on the type of motivational construct examined (Vu et al., 2024).

Nevertheless, achievement motivation alone may not sufficiently explain differences in academic performance among student-athletes. High levels of motivation may not automatically lead to improved academic outcomes without the presence of psychological beliefs that enable students to translate motivation into effective actions. Social Cognitive Theory proposed by Bandura (1997) emphasizes that self-efficacy, defined as an individual's belief in their capability to organize and execute actions required to achieve desired goals, represents a critical determinant of effort, persistence, and behavioral regulation. Within educational contexts, academic self-efficacy has consistently been identified as a strong predictor of academic engagement, learning persistence, and academic achievement across different cultures and educational levels (Doménech-Betoret et

al., 2017; Usán Supervía *et al.*, 2022; Wang & Yu, 2023). Accordingly, academic self-efficacy may serve as an important psychological pathway through which achievement motivation influences academic performance. Students with strong achievement motivation may develop stronger beliefs in their academic capabilities, which subsequently encourage greater effort, persistence, and effective learning strategies.

Although previous studies have explored the relationship between motivation, self-efficacy, and academic achievement, several limitations remain. First, existing evidence has predominantly focused on university students or collegiate athletes, while the mechanism underlying these relationships among adolescent student-athletes at the secondary school level remains insufficiently explored (Li *et al.*, 2022). Second, research examining student-athletes in developing countries, particularly within the Indonesian educational context, remains limited. Indonesian junior and senior high school student-athletes face unique challenges because they must comply with academic requirements while participating in competitive sports programs with limited institutional support and resources. Furthermore, studies that specifically investigate academic self-efficacy as a mediating mechanism linking achievement motivation to academic performance among school-age student-athletes are still scarce (Han *et al.*, 2022; Niehues *et al.*, 2025). This represents an important research gap because understanding the psychological mechanism underlying academic success among student-athletes may contribute to more targeted educational and athletic interventions.

The present study addresses this gap by examining the mediating role of academic self-efficacy in the relationship between achievement motivation and academic performance among middle and high school student-athletes in Bandung, Indonesia. The novelty of this research lies in investigating a relatively underrepresented population and testing a psychological pathway that explains how athletic experiences may contribute to academic outcomes. Rather than examining achievement motivation as a direct predictor of academic performance, this study proposes that academic self-efficacy functions as an explanatory mechanism that enables student-athletes to transform achievement-oriented tendencies into academic success.

The findings of this study are expected to provide both theoretical and practical contributions. Theoretically, this research expands the application of achievement motivation theory and social cognitive theory by explaining how psychological resources developed through competitive sports may influence academic functioning. Practically, the findings may assist teachers, coaches, school counselors, and educational policymakers in designing integrated support programs that strengthen both athletic development and academic achievement among student-athletes. Given the increasing emphasis on holistic adolescent development, investigating the psychological processes that support student-athletes' success in both domains is essential for promoting sustainable educational and athletic outcomes.

RESEARCH METHOD

A quantitative correlational design with mediation analysis is used in this study. The data were collected cross-sectionally at a single time point and the design was chosen due to the aim being to test the relationships among variables as well as to identify the psychological mechanism of academic self-efficacy which links achievement motivation to academic performance. The target population included junior high (SMP) and senior high (SMA) students in Bandung who are actively representing their schools in athletic competitions. The inclusion criteria were: (1) enrolled as an active SMP or SMA student; (2) a member of a school sports team in any sport; and (3) participation in at least one interscholastic competition in the preceding 12 months. The sampling used a purposive snowball technique through sports-team coordinators at several schools.

Students at middle-high (SMP) and high-school (SMA) make up a hard-to-reach population. This means that the number of active student representatives in official competitions is minimal relative to the general student body. This presents some practical constraints on data collection. Of 63 responses received, three were excluded (one university student who did not meet the SMP/SMA criterion and two without confirmed grade level), yielding 60 valid participants ($N = 60$) with complete data on all scale items. Sample adequacy was evaluated with reference to the power literature for mediation analysis. Fritz and MacKinnon (2007) show that, using bootstrapping, the

most powerful method for testing indirect effects detecting a mediated effect at .80 power and $\alpha = .05$ requires approximately 71 participants when both paths (a and b) are medium ($\beta \approx .39$), but only about 34–46 participants when the paths are large ($\beta \approx .59$). As motivation–self-efficacy relationships in sport psychology tend to be medium-to-large (Han et al., 2022; Li et al., 2022b), a sample of 60 was judged adequate to detect a medium-to-large mediated effect. A Monte Carlo sensitivity power analysis following Schoemann, Boulton, and Short (2017) was done to establish the minimum detectable effect at $N = 60$. Given the sample size, the study is framed as a preliminary investigation of a specialized population, and this limitation is considered explicitly in the interpretation of the results.

Achievement motivation (X) was measured using a 20-item scale which was adapted from the Hermans (1970) *Prestatie Motivatie Test* on a four-point scale (1 = strongly disagree; 4 = strongly agree). Following item analysis, one item was found to be irregular and was removed, resulting with a 19-item scale used in the analysis. The academic self-efficacy (M) was measured by a 25-item Indonesian TASES (Sagone & De Caroli, 2014; Darmayanti et al., 2021) on a five-point scale (1 = not confident at all; 5 = very confident). Academic performance (Y) was measured by the self-reported most recent semester report-card grade category and was divided into four categories (< 70 / $70-79$ / $80-89$ / ≥ 90). Originally, the perception sub-scale design was not included in the final instrument. This is why academic performance was shown using this single ordinal indicator. The operational definitions and sources are summarized in Table 1.

Table 1. Operational Definitions, Indicators, and Sources of the Variables

Variable	Operational Definition	Source
<i>Achievement Motivation (X)</i>	Students' drive to compete, master tasks, and attain standards of excellence, across aspiration, risk-taking/persistence, task/time orientation, and competitive orientation.	Hermans (1970); McClelland (1987); Elliot & Church (1997)
<i>Academic Self-Efficacy (M)</i>	Students' belief in their capability to plan and carry out academic tasks (self-engagement, decision-making, problem-solving, interpersonal climate).	Sagone & De Caroli (2014); Darmayanti et al. (2021)
<i>Academic Performance (Y)</i>	Students' attainment indexed by the self-reported most recent semester report-card grade category.	Kuncel et al. (2005); Pujianto et al. (2024)

Source: developed from various references (2026)

The analysis was done in five stages. First is descriptive statistics, it summarized respondent characteristics and score distributions. Second, item quality was evaluated through corrected item-total correlations and the consistency was checked using Cronbach's Alpha ($\geq .70$ threshold; Hair et al., 2019). Third, the normality of the variables was assessed with the Shapiro–Wilk test. Fourth, Pearson (and, for robustness given the ordinal outcome, Spearman) correlations were computed. Fifth, the mediating role of academic self-efficacy was tested using a regression-based mediation analysis with bootstrap testing of the indirect effect, following Hayes' (2022) approach (equivalent to PROCESS Model 4). The path framework distinguishes path a ($X \rightarrow M$), path b ($M \rightarrow Y$), path c (total effect $X \rightarrow Y$), and path c' (direct effect $X \rightarrow Y$ controlling for M). To determine the significance of the indirect effect ($a \times b$), a bias-corrected bootstrap 95% confidence interval with 5,000 resamples was used (Preacher & Hayes, 2008; Hayes, 2022). The indirect effect is only significant if the interval excludes zero. As bootstrapping does not rely on the normality assumption and provides more valid and powerful inference than the Sobel test, particularly with limited sample sizes, it was chosen as the testing method (Fritz & MacKinnon, 2007).

RESULTS AND DISCUSSION

Respondent Characteristics

The 60 valid participants were mostly female (37; 61.7%) versus male (23; 38.3%), with a mean age of 14.56 years ($SD = 1.64$; range 12–18). The two levels were relatively balanced: 34 junior high (56.7%) and 26 senior high (43.3%). Basketball (43.3%) and swimming (25.0%) were the most represented sports. Respondent characteristics are presented in Table 2.

Table 2. Respondent Characteristics (N = 60)

Characteristic	Category	f	%
Gender	Female	37	61.7
	Male	23	38.3
Level	Junior high (SMP, grades 7–9)	34	56.7
	Senior high (SMA, grades 10–12)	26	43.3
Sport	Basketball	26	43.3
	Swimming	15	25.0
	Badminton	5	8.3
	Volleyball	3	5.0
	Futsal/Football	3	5.0
	Other	8	13.3
Grade Category	Excellent (≥ 90)	21	35.0
	Good (80–89)	33	55.0
	Satisfactory (70–79)	5	8.3
	Poor (< 70)	1	1.7

Source: primary data processed (2026).

Validity and Reliability

The sample size ($N = 60$) was insufficient for confirmatory factor analysis of 45 items. For this reason, the instrument quality was evaluated through internal consistency and corrected item-total correlations, both core instruments which were derived from previously validated scales (Hermans, 1970; Sagone & De Caroli, 2014; Darmayanti et al., 2021). The Cronbach's Alpha was .841 for the first 20-item achievement-motivation scale and .947 for the 25-item academic self-efficacy scale. An item analysis identified one motivation item with a corrected item-total correlation which was far below the acceptable threshold ($r = 0.12$) and it was removed. Once removed, the refined 19-item scale showed item-total correlations of .30–.70, Alpha rose to 0.846. Item-total correlations for academic self-efficacy ranged from 0.52 to 0.75. Descriptive statistics and reliability are summarized in Table 3.

Table 3. Descriptive Statistics and Reliability

Variable	Scale range	M	SD	α
Achievement Motivation (X)	1–4	3.12	0.34	0.846
Academic Self-Efficacy (M)	1–5	3.59	0.60	0.947
Academic Performance (Y)	1–4	3.23	0.67	–

Source: primary data processed (2026).

Assumption Tests

Shapiro–Wilk tests revealed that achievement motivation ($W = 0.964$, $p = 0.071$) and academic self-efficacy ($W = 0.982$, $p = 0.533$) were normally distributed, whereas academic performance departed from normality ($W = 0.778$, $p < 0.001$), typical for an ordinal grade-category indicator that clusters in the higher categories (a ceiling effect). This condition underscores the appropriateness of bootstrapping, which does not depend on distributional normality. Multicollinearity was not a concern ($VIF < 1.5$).

Correlation Analysis

All variables were positively and significantly correlated (Table 4). Achievement motivation correlated strongly with academic self-efficacy ($r = 0.581$, $p < .001$), academic self-efficacy correlated strongly with academic performance ($r = 0.554$, $p < .001$), and achievement motivation correlated moderately with academic performance ($r = 0.417$, $p < 0.001$). To ensure consistency, the Spearman correlation was used and the same pattern was shown ($\rho = 0.506$, $p < 0.001$ for self-efficacy–performance).

Table 4. Inter-Correlations among Variables

Variable	1	2	3
1. Achievement Motivation	–		
2. Academic Self-Efficacy	0.581***	–	
3. Academic Performance	0.417***	0.554***	–

Source: primary data processed (2026).

Mediation Analysis and Hypothesis Testing

The role of academic self-efficacy was tested using a method called regression-based bootstrapping (5,000 resamples; bias-corrected 95% CI). The results are reported in Table 5 and visualized in Figure 2. It showed that achievement motivation had a positive and significant effect on academic self-efficacy (path a: $B = 1.042$; $\beta = 0.581$; $p < 0.001$), supporting H1. Similarly, academic self-efficacy also had a positive, significant effect on academic performance (path b: $B = 0.524$; $\beta = 0.470$; $p < 0.001$), supporting H2. The total effect of achievement motivation on academic performance was significant (path c: $B = 0.834$; $\beta = 0.417$; $p < 0.001$). However, when academic self-efficacy was included as a mediator, the direct effect of achievement motivation on academic performance became no longer significant (path c': $B = 0.287$; $\beta = 0.144$; $p = 0.289$). Thus, suggesting that H3 (a direct effect) was not supported and showing that the influence of achievement motivation on academic performance operated entirely through academic self-efficacy.

The indirect effect ($a \times b$) was 0.547, including a bias-corrected 95% CI of [0.235, 1.041] but not zero, indicating a significant mediated effect ($\beta = 0.273$, 95% CI [0.115, 0.503]). The pattern was shown consistent with full mediation as about 65.5% of the total effect was mediated. Moreover, the direct effect became insignificant whereas the indirect effect remained significant. Therefore, H4 was supported with the model accounting for 33.8% of the difference in academic self-efficacy and 32.0% of the difference in academic performance. A Monte Carlo sensitivity analysis also indicated that, at $N = 60$, the study had the ability (≈ 0.92) to detect the observed mediated effect, with the minimum detectable effect at approximately $\beta \approx 0.42$.

Table 5. Bootstrap Mediation Results ($N = 60$)

Path	B	SE	β	p / 95% CI
a: Motivation → Self-Efficacy	1.042	0.192	0.581	< .001
b: Self-Efficacy → Performance	0.524	0.150	0.470	< .001
c: Total effect (Motivation → Performance)	0.834	0.239	0.417	< .001
c': Direct effect (Motivation → Performance)	0.287	0.268	0.144	0.289
Indirect effect ($a \times b$)	0.547	–	0.273	[0.235, 1.041]

Source: primary data processed (2026).

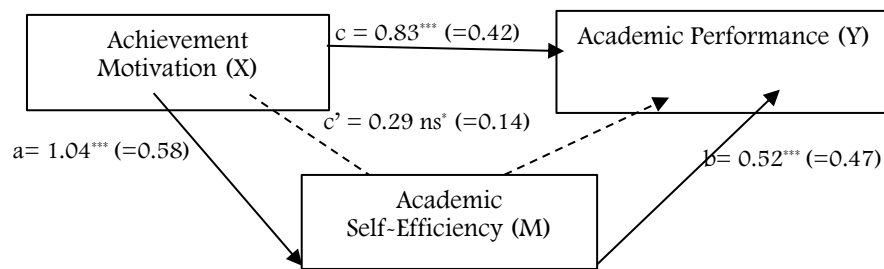


Figure 2. Statistical Mediation Model with Path Coefficients

Discussion

The main finding is that achievement motivation did not affect academic performance directly. Instead, it is through strengthening academic self-efficacy. H1 is consistently supported by the social cognitive theory (Bandura, 1997) in which having lots of experience, abundant in the training-and-competition cycle of student-athletes, are the primary source of efficacy beliefs (Han et al., 2022; Li et al., 2022b). Support for H2 reinforces the well-established role of academic self-belief as a strong predictor of academic performance (Doménech-Betoret et al., 2017; Usán Supervía et al., 2022; Wang & Yu, 2023). The main result showed that H4 was supported whereas H3 was not. When academic self-efficacy was controlled, the effect of achievement motivation on academic performance disappeared while the indirect effect remained significant (65.5% mediated). Through this finding, it is suggested that achievement motivation is not a direct determinant of academic performance but instead works by building academic self-belief first—similar to the mediation chain that was reported among college students (Li et al., 2022a) and the centrality of self-efficacy emphasized in recent school-level meta-analytic evidence (Vu et al., 2024).

Theoretically, these results extend the motivation–self-efficacy–performance model to the understudied population of Indonesian SMP and SMA student-athletes. Practically, they imply that efforts to raise student-athletes' academic performance should not stop at arousing motivation but should target academic self-belief through constructive feedback from teachers and coaches, realistic yet challenging learning goals, and time-management support around training and competition. Teachers, school counselors, and coaches thus play a strategic role in cultivating academic self-efficacy. However, a few limitations should be noted. First, the modest sample ($N = 60$) makes this a preliminary study. Even though the sensitivity analysis showed sufficient power for medium-to-large effects, larger samples are required for better generalization. Second, the academic performance was measured through a self-reported grade which might have exhibited a ceiling effect. For this reason, future studies should use actual grades or a more continuous index for more accuracy. Third, the study was done neither through a long period of time nor experimental designs which might strengthen causal claims. Fourth, purposive snowball sampling limits representativeness. Future studies should broaden the range of schools and sports.

CONCLUSION

This study concludes that academic self-efficacy plays a critical mediating role in explaining the relationship between achievement motivation and academic performance among middle and high school student-athletes in Bandung, Indonesia. The findings demonstrate that achievement motivation does not directly enhance academic performance but operates primarily through the strengthening of students' academic self-beliefs. Student-athletes with higher achievement motivation tend to develop stronger academic self-efficacy, which subsequently enables them to demonstrate greater persistence, confidence, and engagement in academic tasks. These findings extend previous research by highlighting the psychological mechanism through which experiences and motivational orientations developed in competitive sports may contribute to academic success among adolescent athletes. Therefore, academic self-efficacy should be considered a key psychological resource in understanding how student-athletes manage the demands of dual roles as both competitive athletes and learners.

Future research should examine this relationship using larger and more diverse samples across different regions and educational contexts to improve the generalizability of findings. Longitudinal and experimental designs are also recommended to provide stronger evidence regarding causal relationships among achievement motivation, academic self-efficacy, and academic performance. For practitioners, including teachers, coaches, and school counselors, interventions should not only focus on enhancing athletic skills and achievement motivation but also incorporate strategies that strengthen academic self-efficacy, such as goal-setting training, self-regulated learning strategies, and academic mentoring. At the policy level, educational institutions should consider developing integrated support systems that accommodate both athletic development and academic needs, ensuring that student-athletes receive balanced opportunities to succeed in both domains.

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