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Positive Academic Emotions and Academic Performance: A Structural Model Examining Resilience as a Mediator

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Abstract

This study examines the relationship between positive academic emotions, resilience, and academic performance among vocational high school students. The background of this research is based on the increasing academic pressure experienced by twelfth-grade vocational students who are required to complete academic responsibilities while preparing for future careers or higher education. Positive academic emotions and resilience are considered important psychological factors that may influence students' academic achievement. Therefore, this study aims to analyze the effect of positive academic emotions on academic performance and to investigate the mediating role of resilience. This research employed a quantitative approach using a cross-sectional design. Data were collected from 119 vocational high school students in Bandung through questionnaires distributed directly in classrooms. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software. The analysis included validity, reliability, and structural model testing. The findings revealed that positive academic emotions significantly and positively affect academic performance. Positive academic emotions also showed a strong positive effect on resilience, while resilience significantly influenced academic performance. Furthermore, resilience was confirmed as a partial mediating variable in the relationship between positive academic emotions and academic performance. These results indicate that students with stronger positive emotions and resilience tend to achieve better academic outcomes. In conclusion, positive academic emotions and resilience play important roles in improving students' academic performance. Educational institutions are encouraged to develop supportive learning environments that foster positive emotions and strengthen resilience among students.

INTRODUCTION

Twelfth-grade students at vocational high schools (SMK) are in a phase marked by significant challenges and heavy academic demands. These students are not only required to complete various exams and academic assignments but must also prepare to enter the workforce or pursue higher education. This pressure is, of course, a factor that students cannot ignore when determining their academic success. Given these conditions, research into the psychological factors that support academic performance is relevant and important.

Academic performance is an indicator of student success in the learning process, encompassing comprehensive cognitive, affective, and psychomotor achievements (Steinmayr

et al., 2019). Several studies have shown that academic performance is determined not only by cognitive capabilities but also by students' emotional and psychological factors (Pekrun et al., 2011). One psychological factor that has been extensively studied in recent years is positive academic emotion, which refers to pleasurable emotions that arise in the context of learning, such as curiosity, pride, hope, and enjoyment.

According to Control-Value Theory (Pekrun, 2006), positive academic emotions play a crucial role in supporting student's motivation, learning strategies, and achievement. Positive academic emotions have been shown to enhance the use of effective learning strategies, strengthen intrinsic motivation, and improve students' cognitive capacity to process information. This is supported by several studies showing a positive correlation between positive academic emotions and student academic achievement across various educational levels (Ahmed et al., 2013).

In addition to positive academic emotions, resilience is also considered a psychological variable that plays a crucial role in students' academic achievement. Resilience is defined as an individual's ability to adapt positively and bounce back from stress, difficulties, or threatening conditions. In an educational context, academic resilience enables students to persevere and function effectively despite facing obstacles, failures, or intense pressure. Students with high levels of resilience tend to be better able to manage academic stress, maintain motivation to learn, and achieve optimal performance even in high-pressure situations (Cassidy, 2016).

Global education systems are increasingly required to produce students who are not only academically competent but also emotionally adaptive, resilient, and ready to face complex transitions after graduation. This issue is especially relevant at the upper-secondary level, where students begin to encounter stronger academic pressure, career expectations, and uncertainty about future pathways. The global learning crisis shows that many education systems still struggle to ensure strong learning outcomes; the World Bank reports that learning poverty remains a major challenge, including in Indonesia where 49% of students do not reach minimum proficiency at the end of primary school. This condition indicates that academic performance cannot be understood merely as a cognitive issue, but must also be examined through psychological factors that support students' persistence and achievement.

In vocational education, the challenge is more complex because students are expected to master academic knowledge while also preparing for employment or further education. OECD data show that vocational-track students may face greater difficulty in later academic progression, with bachelor's completion rates among vocational-track entrants slightly lower than those from general upper-secondary tracks. This suggests that vocational students need stronger psychological resources to manage academic demands and transition pressures. Therefore, the study of academic performance among vocational high school students is important because their success is shaped not only by learning facilities and curriculum quality, but also by emotional experiences and resilience in facing academic challenges.

Academic performance refers to students' achievement in the learning process, including cognitive, affective, and psychomotor outcomes. In the context of vocational high school students, academic performance reflects students' ability to understand learning materials, complete academic tasks, demonstrate learning fluency, and maintain competence in both theoretical and practical fields. However, academic achievement is not determined solely by

intelligence or technical ability. The uploaded manuscript explains that psychological and emotional factors also play an important role in shaping student achievement, especially among twelfth-grade vocational students who experience pressure from exams, assignments, career preparation, and future educational choices.

One important psychological factor in this context is positive academic emotion. Positive academic emotions refer to pleasant emotions experienced during learning, such as enjoyment, hope, pride, curiosity, and relief. Based on Pekrun's Control-Value Theory, these emotions can strengthen motivation, improve learning strategies, increase cognitive engagement, and support academic achievement. Previous studies cited in the manuscript, such as Pekrun et al., Ahmed et al., and Frenzel et al., show that positive academic emotions are positively associated with students' learning outcomes and achievement. Thus, students who experience positive emotions in academic settings are more likely to show persistence, enthusiasm, and better learning performance.

In addition to positive academic emotions, resilience is another key variable that supports academic performance. Resilience refers to students' ability to recover, adapt, and continue functioning effectively despite academic stress, failure, or pressure. In educational settings, resilient students are better able to regulate emotions, maintain optimism, use coping strategies, and remain motivated when facing difficult learning situations. The manuscript emphasizes that resilience helps students manage academic stress and achieve optimal performance even under demanding conditions. Therefore, resilience is highly relevant for vocational students who must balance academic requirements with practical competencies and career readiness.

The relationship between positive academic emotions and resilience can be explained through Fredrickson's Broaden-and-Build Theory. This theory states that positive emotions broaden students' thinking and action patterns while gradually building psychological resources, including resilience. Students who frequently experience enjoyment, hope, and pride in learning are more likely to develop confidence, adaptive coping, and emotional regulation. Prior studies cited in the manuscript, such as Tugade and Fredrickson as well as Martínez-Martí and Ruch, support the view that positive emotions help individuals recover from stress and strengthen resilience. This means that positive academic emotions may not only influence achievement directly but also indirectly through resilience.

Several previous studies from Scopus- and Google Scholar-indexed literature have examined these variables, but often separately. Pekrun et al. developed the Achievement Emotions Questionnaire and showed the importance of academic emotions in learning and performance. Martin and Marsh found that academic resilience predicts grades, attendance, and engagement. Cassidy also demonstrated that resilience is related to academic self-efficacy and achievement. Meanwhile, MacCann et al. found in a meta-analysis that emotional intelligence and emotion-related abilities predict academic performance. These studies provide a strong foundation for examining emotions, resilience, and achievement; however, they do not fully explain how positive academic emotions influence academic performance through resilience among Indonesian vocational high school students.

The research gap lies in the limited number of studies that integrate positive academic emotions, resilience, and academic performance into one structural mediation model, especially in the context of vocational education in Indonesia. Most previous studies have focused on university students, general high school students, or Western educational contexts.

The uploaded manuscript also notes that studies positioning resilience as a mediating variable between positive academic emotions and academic performance remain rare. Therefore, further research is needed to understand whether students' positive academic emotions can improve academic performance directly and indirectly by strengthening resilience.

The urgency of this research is based on the need to support vocational high school students in facing academic and career-related pressures. Twelfth-grade students are at a crucial stage because they must complete final academic requirements while preparing for work or higher education. Without adequate emotional support and resilience, students may experience reduced motivation, stress, and lower academic outcomes. This study is also urgent because schools need empirical evidence to design learning environments that foster positive emotions and resilience, not only cognitive competence. Such evidence can help educators develop mentoring, student-centered learning, and psychological support programs that improve sustainable academic success.

The novelty of this study lies in its structural model that examines positive academic emotions, resilience, and academic performance simultaneously using SEM-PLS. This study offers a more comprehensive perspective by testing resilience as a mediator in the relationship between positive academic emotions and academic performance. The purpose of this research is to analyze the influence of positive academic emotions on academic performance and to examine the mediating role of resilience among twelfth-grade vocational high school students. The contribution of this study is theoretical and practical: theoretically, it enriches educational psychology literature in the Indonesian vocational context; practically, it provides useful guidance for schools to strengthen students' positive emotions and resilience as foundations for better academic achievement.

METHOD

This study employed a quantitative approach with a cross-sectional design to examine the relationship between positive academic emotions, resilience, and academic performance among vocational high school students in Bandung, with a sample of 119 students selected randomly using incidental sampling, sampling based on the availability and ease of access to respondents during the study (Creswell & Creswell, 2018). Data collection was conducted simultaneously at a single time using a paper-and-pencil questionnaire distributed directly in the classroom, ensuring all respondents completed the instrument under relatively similar conditions and at the same time to minimize contextual variation in completion. The research instrument consisted of 147 initial statements based on a Likert scale measuring three main variables: 73 indicators for academic performance (covering the dimensions of academic learning, academic fluency, academic competence, and other performance dimensions), 17 indicators for positive academic emotions (covering the dimensions of enjoyment/EEN, hope/EHO, pride/EPR, and relief/ERE), and 57 indicators for R (covering the dimensions of emotional regulation/REM, optimism/ROP, role models/RRO, self-efficacy/RSE, relationships/RER, internal characteristics/RIC, and coping adaptability/RCA). Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software, where the outer model evaluation included tests of convergent validity (outer loadings ≥ 0.70; AVE ≥ 0.50), discriminant validity (Fornell-Larcker and HTMT criteria < 0.90), and reliability (Composite Reliability ≥ 0.70; Cronbach's Alpha ≥ 0.60), resulting in

10 valid and reliable final indicators: three for AP (PLAF304, PLAF305, PLAF404), three for AE (EEN101F, EHO103F, ERE104F), and four for R (REM207, ROP204, RRO105, RSE104) (Hair et al., 2019). Testing of the structural model (inner model) was conducted using a bootstrapping procedure with 5,000 subsamples to test the significance of direct paths and mediating effects, and was evaluated using the coefficient of determination (R^2), effect size (f^2), and path coefficients (β), along with their t-statistics and p-values Henseler et al., 2015).

RESULT AND DISCUSSION

This study aims to examine the effect of academic positive emotions (AE) on academic performance (AP), with resilience (R) as a mediator. The analysis was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach with the assistance of SmartPLS software. The results of the measurement model (outer model) and structural model (inner model) are presented as follows.

Convergent Validity Test

Convergent validity was evaluated using outer loadings and Average Variance Extracted (AVE). All retained indicators showed outer loadings of ≥ 0.70, namely: positive academic emotion indicators (EEN101F = 0.748; EHO103F = 0.774; ERE104F = 0.786), academic performance indicators (PLAF304 = 0.829; PLAF305 = 0.832; PLAF404 = 0.740), and resilience indicators (REM207 = 0.733; ROP204 = 0.707; RRO105 = 0.722; RSE104 = 0.723). All exceeded the required minimum threshold of 0.50 (Hair et al., 2019).

Table 1. Average Variance Extracted (AVE) scores for the three variables

	AVE	Notes
Positive Academic Emotions	0,592	Valid
Resilience	0,520	Valid
Academic Performance	0,642	Valid

Source: Research Data Processed by Authors (2026)

Discriminant Validity Test

Discriminant validity was tested using the Fornell-Larcker criteria and the HTMT (Heterotrait-Monotrait) ratio. Discriminant validity was assessed using two approaches: cross-loading and the Fornell-Larcker criteria, as well as the HTMT (Heterotrait-Monotrait) ratio. The cross-loading results indicate that each indicator has the highest loading value on the intended construct compared to other constructs. The AVE square root values on the diagonal of the Fornell-Larcker matrix (academic performance = 0.801; positive academic emotions = 0.769; resilience = 0.721) are greater than the interconstruct correlations, thus fulfilling discriminant validity. All HTMT values are below the 0.90 threshold (Henseler et al., 2015), indicating no issues with discriminant validity.

Table 2. **HTMT (Heterotrait-Monotrait Ratio) scores for the three variables**

	HTMT
Positive academic emotions ↔ Academic performance	0,754
Resilience ↔ Academic performance	0,599
Resilience ↔ Positive academic emotions	0,680

Source: Research Data Processed by Authors (2026).

Reliability

Construct reliability was assessed using Composite Reliability (CR) and Cronbach's Alpha. The CR values were 0.843 for academic performance, 0.813 for positive academic emotions, and 0.813 for resilience. All constructs met the minimum CR threshold of ≥ 0.70; therefore, all constructs were deemed reliable.

Table 3. **Reliability scores**

	Composite Reliability	Notes
Positive academic emotions	0,813	Reliable
Resilience	0,813	Reliable
Academic performance	0,843	Reliable

Source: Research Data Processed by Authors (2026).

Coefficient of Determination

The results of the structural model evaluation show an R^2 value of 0.334 (adjusted R^2 = 0.322) for the Academic Performance (AP) construct, indicating that the predictor variables in the model account for 32.2% of the variation in academic performance. Meanwhile, the Resilience (R) construct has an R^2 of 0.224 (adjusted R^2 = 0.218), explaining 21.8% of the variation. Based on the categories established by Hair et al. (2019), both values are classified as weak, yet they remain theoretically significant in behavioral research.

Effect Size (f^2)

The effect size (f^2) for the influence of positive academic emotions on academic performance is 0.226, which is classified as a moderate effect. Meanwhile, the influence of resilience on academic performance yields an f^2 of 0.056, which is classified as a small effect. These findings indicate that positive academic emotions contribute more substantially to academic performance than resilience.

Structural Models & Statistical Summary

Table 4. Structural model of the three variables

Path	β	T-stat	p-value	Notes
Positive academic emotions → Academic performance (direct)	0,441	4990	0,000	Significant
Positive academic emotions → Resilience	0,474	6593	0,000	Significant
Resilience → Academic performance	0,219	2262	0,024	Significant
Positive academic emotions → Resilience → Academic performance (mediation)	0,104	2113	0,035	Partial mediation

Source: Research Data Processed by Authors (2026).

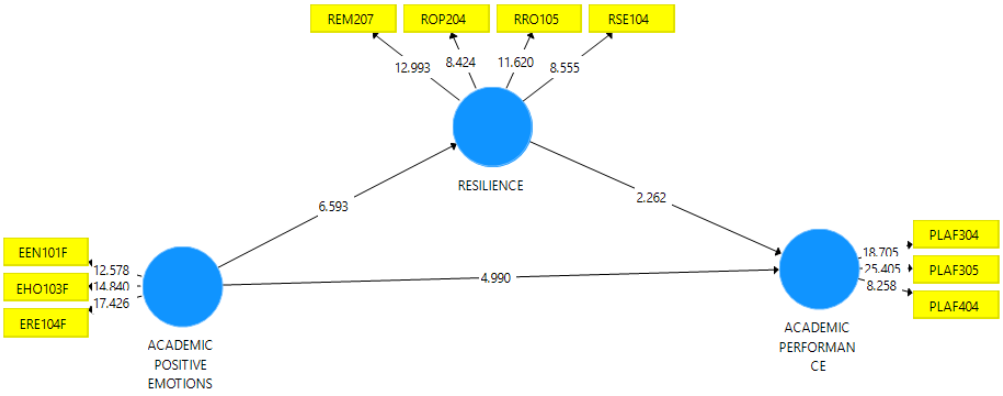

Figure 1. Path diagram of the relationship between positive academic emotions and academic performance mediated by resilience

The effect of positive academic emotions on academic performance

The first finding indicates that positive academic emotions have a significant and positive effect on students' academic performance (β = 0.441; p = 0.000). These results are consistent with the Control-Value Theory of Achievement Emotions developed by Pekrun, (2006), which asserts that only three types of positive emotions, enjoyment, hope, and pride, foster intrinsic motivation, the use of deep learning strategies, and greater cognitive engagement, ultimately enhancing academic achievement.

Several previous studies support this study. A longitudinal study conducted by Pekrun et al. (2011) involving 3,425 college students, the study found that positive academic emotions, particularly enjoyment of learning, predicted higher exam scores and GPAs. Similarly, Putwain et al. (2018) reported that positive emotions contribute to stronger learning motivation and academic engagement, which indirectly improve academic performance. Frenzel et al. (2007) also confirmed that students experiencing higher levels of positive emotions tend to be more persistent and use more effective elaboration strategies in the learning process. The moderate effect size (f^2 = 0.226) indicates that positive academic emotions contribute to academic performance, suggesting that interventions aimed at enhancing positive academic emotions can positively impact students' academic performance.

The effect of positive academic emotions on resilience

The second finding demonstrates that positive academic emotions have a significant positive effect on student resilience ($\beta = 0.474$; $p = 0.000$). This path coefficient is the largest in the model, indicating that positive emotions are the strongest predictor of resilience among the variables in this study. These results align with the Broaden-and-Build Theory proposed by Fredrickson (2001), which explains that positive emotions can enhance cognitive capacity and broaden an individual's range of actions (broadening effect), and cumulatively build more enduring psychological resources (building effect), including resilience. Individuals who experience positive emotions more frequently develop greater cognitive flexibility and better coping skills when facing stress.

In an academic context, Tugade & Fredrickson, (2004) demonstrated that more resilient individuals recover more quickly from stress and maintain adaptive psychological functioning. Another study by Martínez-Martí & Ruch (2017) among college students, a positive relationship between positive emotions and academic resilience was also found, with positive emotions serving as a buffer against the negative effects of academic failure.

The effect of resilience on academic performance

The third finding indicates that resilience has a positive and significant effect on academic performance ($\beta = 0.219$; $p = 0.024$), albeit with a small effect size ($f^2 = 0.056$). This suggests that students with higher psychological resilience, characterized by the ability to bounce back from difficulties, effective emotional regulation, and a problem-solving orientation, are likely to achieve better academic performance.

This finding is consistent with the research by Martin & Marsh (2008), who found that academic resilience significantly predicted academic grades, attendance, and school engagement in a large sample of students. Resilient students demonstrate greater persistence in tackling challenging academic tasks and are more effective at managing time and learning resources. In line with this, Cassidy (2015) concluded that resilience is consistently positively associated with academic achievement, with the primary mechanisms being self-regulation and stronger motivation.

The small effect size ($f^2 = 0.056$) in this study may reflect that the influence of resilience on academic performance is more indirect, operating through mechanisms such as learning strategies, motivation, and engagement, rather than a large direct effect. This is also consistent with Zimmerman's (2000) view that resilience is a key component of self-regulated learning, which cumulatively shapes academic performance over time.

Partial mediation of resilience in the relationship between positive academic emotions and academic performance

A key finding of this study is the confirmation of resilience's role as a partial mediator in the relationship between positive academic emotions and academic performance. Partial mediation occurs because the direct effect of AE on AP remains significant ($\beta = 0.441$; $p = 0.000$) after including the mediator in the model, while the indirect effect via resilience is also significant ($\beta = 0.104$; $p = 0.035$). This means that positive academic emotions influence academic performance through two pathways: (1) directly, and (2) indirectly through the development of resilience.

This pattern of partial mediation is theoretically consistent with the integration of Control-Value Theory Pekrun, (2006) and the Broaden-and-Build Theory Fredrickson, (2001). Positive emotions directly affect the cognitive and motivational processes that drive academic performance, while simultaneously building psychological capacity (resilience) that strengthens students' ability to cope with academic challenges. This dual mechanism was proposed by Pekrun & Linnenbrink-Garcia (2012), who argue that academic emotions influence performance through multiple cognitive, motivational, and behavioral pathways simultaneously.

These findings are also empirically supported by Datu et al. (2018), who found that resilience mediates the relationship between positive emotions and academic well-being in a sample of Filipino university students, as well as by Seligman et al. (2009), who demonstrated that positive emotion-based intervention programs can simultaneously enhance resilience and academic performance. More specifically, in the context of higher education, MacCann et al. (2020), in a meta-analysis of 1,246 studies, found that emotion regulation, as a core component of resilience, is a significant predictor of academic performance.

R^2 Values and Theoretical Implications

The relatively low R^2 values for AP (32.2%) and R (21.8%) indicate that this research model explains only a portion of the variation in students' academic performance and resilience. This is a common finding in educational psychology research using cross-sectional designs, given the complexity of the factors influencing academic performance (Richardson et al., 2012). In a meta-analysis of 916 studies, Richardson et al. (2012) identified over 50 psychological predictors of academic performance, including conscientiousness, test anxiety, motivation, and attribution style, none of which were included in this study's model.

Nevertheless, an R^2 of 32.2% for the primary dependent variable (AP) still provides a meaningful explanatory contribution, given that AE and R are merely two among many factors contributing to academic performance. Within the PLS-SEM framework employed here, this value is considered relevant and interpretable, given the complexity of the research domain.

4.6 Practical implications

In practical terms, the findings of this study have several important implications for higher education institutions. First, fostering positive academic emotions in students is a strategic investment, as it has a twofold impact: it directly improves academic performance and builds resilience. Programs such as academic mentoring, collaborative learning communities, and student-centered learning approaches have proven effective in enhancing positive academic emotions (Harackiewicz et al., 2016).

Second, institutions need to design specific interventions to build student resilience, especially during the first year of college when students face new transitions and pressures. Resilience training programs based on Cognitive Behavioral Therapy (CBT) and mindfulness are effective in academic contexts (Luthans et al., 2010)). Third, given that the mediation is partial, efforts to improve academic performance should not focus on a single pathway but instead take an integrated approach that targets both positive emotions and student resilience.

CONCLUSION

This study aims to examine the effect of positive academic emotions (AE) on academic performance (AP), with resilience (R) as a mediator, using a PLS-SEM approach. The results of the analysis demonstrate that positive academic emotions have a significant and positive effect on students' academic performance, indicating that students with higher levels of positive emotional experiences in a learning context tend to achieve better academic performance. Furthermore, positive academic emotions were found to be a strong antecedent to resilience, and resilience positively affects academic performance. Furthermore, resilience was confirmed as a partial mediator in the relationship between positive academic emotions and academic performance. These findings underscore the importance of higher education institutions not only focusing on developing cognitive competencies but also actively fostering a learning ecosystem that supports students' positive emotions and resilience as the foundation for sustainable academic success.

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