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# DECODING ACADEMIC SUCCESS IN MULTICULTURAL THAILAND: A SECOND-ORDER SEM ANALYSIS OF PERSONALITY, FAMILY, AND ECOLOGICAL DRIVERS

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## Abstract

A complex interplay of internal dispositions and external ecological systems shapes academic achievement in multicultural environments. This study investigates the multi-dimensional determinants of higher education success in Thailand's Southern Border Provinces, a unique Muslim-majority context. Grounded in the Big Five Personality Model, Self-Determination Theory, and Ecological Systems Theory, the research employed a rigorous second-order Structural Equation Modeling (SEM) approach to analyze data from 1,475 undergraduates and 164 lecturers. The empirical results reveal that family support exerts the most profound influence on achievement ( $\beta=0.77$ ), significantly overshadowing individual learner traits. Critically, the analysis uncovered a suppression effect: learner personality traits initially had a negative direct impact but produced positive outcomes when mediated by effective lecturer engagement and instructional quality. Conversely, rigid adherence to cultural communities presented a modest constraint on performance. These findings challenge trait-centric views, suggesting that academic resilience is socially constructed through family dynamics and pedagogical alignment rather than solitary effort. Consequently, this study offers a strategic roadmap for sustainable educational development, advocating policies that synergize family involvement with culturally responsive pedagogy to advance United Nations Sustainable Development Goal 4 across diverse Southeast Asian educational landscapes.

**Keywords:** Academic Achievement, Second-Order SEM, Big Five Personality Traits, Family Support Systems, Multicultural Education

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## Introduction

Education serves as a central force in unlocking human potential and driving social, economic, and cultural progress. However, the rapid transformations of the modern era, shaped by technological advancement and evolving lifestyles, have added complexity to the educational process (Hattie, 2009). Within this context, the personalization of education has become increasingly essential to ensure relevance and effectiveness (Dunn et al., 2009). A critical determinant of learning outcomes is the personality of both learners and lecturers, which directly influences academic achievement and educational success. Learners' traits significantly shape adaptability, motivation, and learning approaches. For example, individuals high in conscientiousness and emotional stability are better able to manage stress and persist through challenges, while openness and enthusiasm enhance creativity and engagement (McCrae & Costa, 1999). Similarly, lecturers' personalities, including flexibility, enthusiasm, and responsiveness to individual differences, create supportive environments that maximize student potential (Kim et al., 2018; Cornelius-White, 2007). This reciprocal relationship underscores the importance of aligning learning processes with the personality profiles of both learners and lecturers.

In an era where technology is integral to education, learners increasingly engage with subjects and activities tailored to their interests and abilities. This reflects the personalized learning paradigm, designed to meet diverse learner needs. By applying personalized learning analytics, lecturers can systematically assess personality traits, learning behaviors, and performance outcomes to design targeted interventions ranging from advanced programs for highly motivated learners to individualized support for those requiring additional guidance (Ryan & Deci, 2020). The integration of personalized learning not only enhances instructional efficiency but also fosters an inclusive educational ecosystem that accommodates diverse personalities. At the intersection of personality, learning, and academic achievement lies the foundation of this study, which seeks to inform the development of adaptive learning systems and evidence-based educational policies that address individual learner needs while ensuring sustainable integration within modern higher education.

Previous research in Thailand has begun to examine lecturer-learner personality alignment and its impact on achievement (Saelim et al., 2023). However, few studies have integrated these factors with family, university, and cultural-community contexts in a second-order SEM framework. Despite extensive international evidence linking personality, motivation, and learning outcomes, this research gap remains particularly evident in Thailand's Southern Border Provinces. In this Muslim-majority context, cultural identity, socioeconomic homogeneity, and religious values shape unique patterns of academic achievement. These characteristics also resonate with other Southeast Asian societies where education is deeply embedded within cultural and community life. Addressing this gap positions the present study as a significant contribution to both theory and practice, offering insights into how personality and contextual factors interact in Asian higher education.

Furthermore, this study emphasizes the importance of sustainability in education. By identifying how family engagement, institutional support, and lecturer development interact with learner personality, the findings contribute to sustainable educational development aligned with the United Nations' Sustainable Development Goal 4 (SDG 4) on inclusive and equitable quality education. The study, therefore, extends beyond academic analysis to inform culturally relevant policies and adaptive learning strategies that strengthen student achievement while promoting long-term resilience in higher education systems across Thailand and Southeast Asia.

Accordingly, this study aims to develop a second-order Structural Equation Model (SEM) to analyze the causal and outcome factors influencing academic achievement among higher education students, identifying both direct and indirect effects of key determinants, including

lecturer and learner personalities, family support, and the learning environment. It also seeks to validate the model's fit with empirical data and to explore the interrelationships among these factors, thereby providing a comprehensive framework for understanding how personality alignment and contextual influences shape academic achievement within higher education.

## **Literature Review**

Academic achievement reflects not only cognitive abilities but also life skills such as critical thinking, problem-solving, and collaboration, making it a key indicator of educational success and societal development. Research consistently shows that personality traits predict achievement: conscientiousness and emotional stability foster persistence, while openness and enthusiasm enhance creativity and engagement (McCrae & Costa, 1999). Lecturer-related traits, including conscientiousness, agreeableness, and extraversion, further contribute to teaching effectiveness, student motivation, and learning outcomes (Kim et al., 2018; Cornelius-White, 2007). These findings underscore that both the learner and the lecturer's personalities are central determinants of educational success.

Beyond personality, social and institutional factors strongly affect learning outcomes. Family support has been shown to play a crucial role, as parental education, daily routines, and financial assistance mediate students' academic performance (Benner et al., 2016). At the institutional level, the quality of university resources and learning environments enhances engagement and improves learning quality. Meanwhile, cultural-community contexts provide both opportunities and constraints: shared traditions and religious values may foster discipline and collective responsibility, but they can also limit autonomy and openness to diverse perspectives. This dual role of culture is particularly relevant in multicultural and faith-based societies where education intersects with deeply rooted cultural norms.

In Southeast Asia, research has begun to emphasize the interaction of personality, culture, and academic outcomes. Evidence from Indonesia and Malaysia demonstrates how Islamic values and family cohesion directly shape students' motivation and persistence in higher education. Similarly, studies in Vietnam highlight the influence of collectivist traditions and family involvement on sustaining persistence and academic resilience. These findings resonate with the Thai Muslim higher education context, especially in the Southern Border Provinces, where cultural and financial homogeneity produce unique dynamics of academic achievement. Such perspectives underscore the importance of contextualized models that consider personality traits alongside cultural and institutional supports.

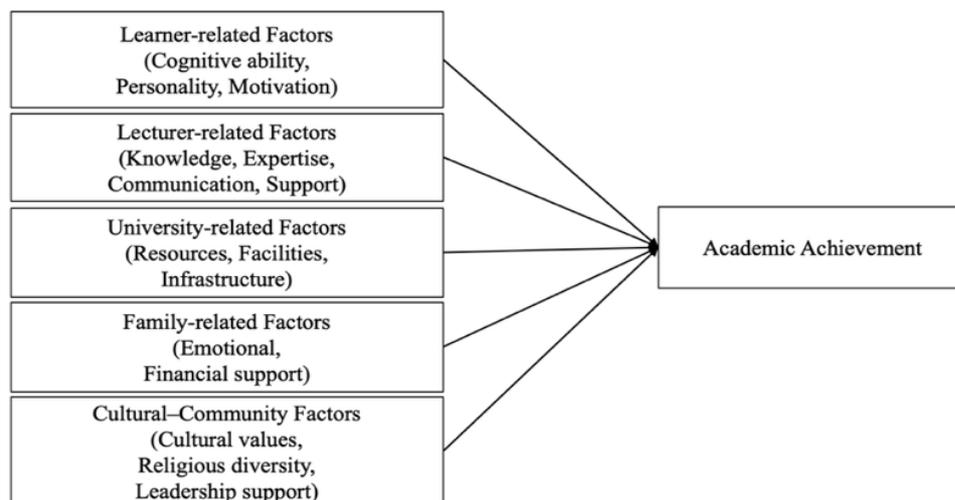
Theoretically, this study draws upon the Big Five Personality Model (McCrae & Costa, 1999), Self-Determination Theory (Ryan & Deci, 2020), and Ecological Systems Theory (Bronfenbrenner, 1979) to explain how individual traits, social supports, and cultural contexts interact to influence academic achievement. However, few studies have integrated these multi-level factors into a second-order Structural Equation Model (SEM), particularly in Muslim-majority regions of Thailand and Southeast Asia. This integration is not only theoretically significant but also practically relevant for advancing sustainable higher education. By embedding the interplay of personality, family, institutional, and cultural factors, this study contributes to a framework for inclusive, equitable, and resilient education aligned with the United Nations Sustainable Development Goal 4 (SDG 4) on quality education (United Nations Educational, Scientific, and Cultural Organization, 2021). Such a perspective emphasizes that sustainable educational development requires models that address both individual success and institutional adaptation in diverse cultural settings.

## **Hypotheses**

H1: Learner and lecturer personality traits exert both direct and indirect positive effects on academic achievement.

H2: The interaction between learners' personality characteristics and lecturers' instructional qualities significantly enhances academic achievement.

H3: The proposed second-order SEM demonstrates an acceptable model fit and effectively captures the multidimensional relationships—including direct, indirect, and interaction effects—among learner traits, lecturer traits, family support, university-related factors, and cultural-community influences in predicting academic achievement.



**Figure 1** Proposed Conceptual Framework

The proposed framework (Figure 1) conceptualizes academic achievement as the outcome of five second-order latent constructs: learner-related traits, lecturer-related traits, family support, university-related factors, and cultural-community influences. The model emphasizes both direct and indirect pathways, as well as the interaction effect between learner and lecturer traits, in shaping student outcomes. This multidimensional approach is grounded in Big Five Personality Theory (McCrae & Costa, 1999), which explains individual dispositions, Self-Determination Theory (Ryan & Deci, 2020), which highlights motivational dynamics fostered by lecturer-learner interactions, and Ecological Systems Theory (Bronfenbrenner, 1979), which situates academic achievement within broader family, institutional, and community contexts.

## Research Methods

This study employed a stratified purposive sampling strategy to ensure representative coverage of both students and lecturers across programs, faculties, and academic years. A total of 1,475 undergraduate students (40.5% male, 59.5% female;  $M$  age = 20.8,  $SD$  = 1.3) and 164 lecturers (45.1% male, 54.9% female;  $M$  age = 39.7,  $SD$  = 6.8) from Yala Rajabhat University participated. Student distribution was balanced across four academic years (Year 1 = 25.8%, Year 2 = 26.9%, Year 3 = 23.7%, Year 4 = 23.6%) and six programs within the Faculty of Management Science—Marketing (18%), Management (17%), Tourism and Hospitality (16%), Communication Studies (15%), International Business (17%), and Digital Business and Innovation (17%). Lecturers represented varying academic ranks, ranging from Assistant to Associate Professors, ensuring diversity in teaching experience.

By integrating demographic and disciplinary diversity, the sampling design strengthened the study's external validity. It provided a multidimensional perspective on lecturer-learner dynamics within the institutional and cultural context of Thailand's Southern Border Provinces (cf. Saelim et al., 2023).

**Measures**

A structured questionnaire comprising 74 items, including the Big Five Inventory (BFI-44), was administered to both learners and lecturers to assess personality traits. All items were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). To ensure psychometric soundness, reliability and validity were examined through Confirmatory Factor Analysis (CFA), Cronbach’s  $\alpha$ , Composite Reliability (CR), and Average Variance Extracted (AVE). Consistent with methodological standards, items with factor loadings below 0.50 were removed from further analysis (Jackson et al., 2009; Hair et al., 2019). The results indicated satisfactory internal consistency and convergent validity across all five traits. Cronbach’s  $\alpha$  values ranged between 0.78 and 0.88, while Composite Reliability (CR) exceeded the recommended 0.70 threshold (0.82-0.90). Average Variance Extracted (AVE) values ranged from 0.50 to 0.60, meeting the minimum criterion of 0.50 and confirming convergent validity. Among the five traits, Conscientiousness emerged as the most robust construct ( $\alpha = 0.88$ , CR = 0.90, AVE = 0.60), reflecting its stability and strong predictive capacity for academic achievement. In contrast, Neuroticism exhibited the lowest reliability indices ( $\alpha = 0.78$ , CR = 0.82, AVE = 0.50), though still within the acceptable range.

Beyond methodological adequacy, these findings align with prior studies that emphasize Conscientiousness as the most stable and reliable predictor of academic outcomes, due to its association with discipline, persistence, and achievement-oriented behaviors (Poropat, 2009; Richardson et al., 2012). The robustness of Conscientiousness observed here further validates its universal relevance, even within the distinct cultural context of Thailand’s Muslim-majority Southern Border Provinces. Conversely, the relatively weaker reliability of Neuroticism is consistent with its conceptualization as a situationally contingent trait, often influenced by stress and socio-cultural conditions (Komarraju et al., 2011). Taken together, the validation of the BFI-44 confirms both the psychometric integrity of the measurement model and its applicability for subsequent SEM analysis, while also reinforcing the theoretical centrality of Conscientiousness in predicting academic success across cultural settings.

**Data Analysis**

A two-stage analytic procedure was used to evaluate the adequacy of the proposed second-order Structural Equation Model (SEM). First, Confirmatory Factor Analysis (CFA) validated the measurement model, with items below the 0.50 factor loading threshold removed to ensure convergent validity and internal consistency (Jackson et al., 2009). Second, the hypothesized SEM was tested to examine interrelationships among learner traits, lecturer attributes, family support, university environment, and cultural-community influences. Model fit was assessed using multiple indices— $\chi^2/df$ , CFI, TLI, IFI, GFI, RMSEA, and SRMR—based on established thresholds (Hu & Bentler, 1999; Kline, 2016).

**Table 1** Model Fit Indices for the Second-Order SEM

Fit Index	Recommended Threshold	Obtained Value*
$\chi^2/df$	< 3.00	2.41
CFI	$\geq 0.90$	0.95
TLI	$\geq 0.90$	0.93
IFI	$\geq 0.90$	0.95
GFI	$\geq 0.90$	0.92
RMSEA	$\leq 0.08$	0.07
SRMR	$\leq 0.08$	0.06

Confirmatory Factor Analysis (CFA) supported the measurement model, with all factor loadings exceeding the recommended threshold of 0.50. Subsequently, the second-order Structural Equation Model (SEM) was estimated to test the hypothesized relationships among

learner traits, lecturer attributes, family support, university environment, and cultural-community influences. The results demonstrated that the model achieved an acceptable level of fit across multiple indices. The  $\chi^2/df$  ratio (2.41) was below the recommended cutoff of 3.00, indicating good parsimony. The Comparative Fit Index (CFI = 0.95), Tucker-Lewis Index (TLI = 0.93), and Incremental Fit Index (IFI = 0.95) all exceeded the 0.90 threshold, suggesting strong model fit. The Goodness-of-Fit Index (GFI = 0.92) also met conventional criteria. In terms of error approximation, both the Root Mean Square Error of Approximation (RMSEA = 0.07) and Standardized Root Mean Square Residual (SRMR = 0.06) were within acceptable limits (< 0.08), providing further support for the model's adequacy. Taken together, these indices demonstrate that the second-order SEM was statistically robust and theoretically consistent, meeting widely accepted standards for SEM model evaluation (Hu & Bentler, 1999; Kline, 2016).

### Research Results

Confirmatory Factor Analysis (CFA). All factor loadings exceeded the 0.50 threshold, confirming the adequacy of the measurement items. Reliability was supported by Cronbach's  $\alpha$  (0.79-0.88) and Composite Reliability (CR = 0.83-0.90), both above the 0.70 standard. Convergent validity was established as Average Variance Extracted (AVE) values ranged from 0.52 to 0.60, surpassing the 0.50 benchmark (Hair et al., 2019). The lecturer construct showed the strongest indices ( $\alpha = 0.88$ , CR = 0.90, AVE = 0.60), while family support ( $\alpha = 0.86$ , CR = 0.89, AVE = 0.58), learner traits ( $\alpha = 0.81$ , CR = 0.85, AVE = 0.56), and university environment ( $\alpha = 0.82$ , CR = 0.86, AVE = 0.55) also demonstrated satisfactory psychometric properties. Cultural-community factors met minimum standards ( $\alpha = 0.79$ , CR = 0.83, AVE = 0.52) with strong loadings (0.84-0.93). Collectively, these findings affirm the robustness of the measurement model.

#### Structural Model Fit.

The second-order SEM showed strong fit indices:  $\chi^2/df = 2.41$  (< 3.00), CFI = 0.95, TLI = 0.93, IFI = 0.95, and GFI = 0.92 (all > 0.90). Error indices were within acceptable limits (RMSEA = 0.07, SRMR = 0.06), confirming model adequacy (Hu & Bentler, 1999; Kline, 2016). The convergence of indices supports the model's robustness and its capacity to capture the multidimensional influences of learner, lecturer, family, institutional, and cultural-community factors on academic achievement in Thailand's Southern Border Provinces.

**Table 2** Model Fit Indices

Fit Index	Threshold	Obtained Value
$\chi^2/df$	< 3.00	2.41
CFI	$\geq 0.90$	0.95
TLI	$\geq 0.90$	0.93
IFI	$\geq 0.90$	0.95
GFI	$\geq 0.90$	0.92
RMSEA	$\leq 0.08$	0.07
SRMR	$\leq 0.08$	0.06

The structural equation modeling (SEM) analysis demonstrated that the hypothesized model achieved a satisfactory fit to the data (see Table 2). The chi-square to degrees of freedom ratio ( $\chi^2/df = 2.41$ ) was below the recommended cutoff of 3.00, indicating good model parsimony. Incremental fit indices further supported model adequacy, with the Comparative Fit Index (CFI = 0.95), Tucker-Lewis Index (TLI = 0.93), Incremental Fit Index (IFI = 0.95), and Goodness-of-Fit Index (GFI = 0.92) all surpassing the conventional threshold of 0.90. In terms of error-based measures, both the Root Mean Square Error of Approximation (RMSEA = 0.07) and

Standardized Root Mean Square Residual (SRMR = 0.06) were below the cutoff value of 0.08, reinforcing the appropriateness of the model specification (Hu & Bentler, 1999; Kline, 2016). Collectively, these results confirm that the model provides a robust representation of the observed data and is suitable for further interpretation of structural relationships.

**Table 3** Direct, Indirect, and Total Effects on Academic Achievement

Path	Direct Effect ( $\beta$ )	Indirect Effect ( $\beta$ )	Total Effect ( $\beta$ )	95% CI (Bootstrap)
Learner→Achievement	-0.07	+0.12	+0.05	[0.01, 0.18]
Lecturer→Achievement	+0.30***	-	+0.30***	[0.22, 0.38]
Family→Achievement	+0.69***	+0.08	+0.77***	[0.65, 0.88]
University→Achievement	+0.16**	-	+0.16**	[0.09, 0.24]
Cultural-Community→Achievement	-0.09*	-	-0.09*	[-0.17, -0.02]

Note: \*\*\* $p < .001$ , \*\* $p < .01$ ,  $p < .05$

Building on this strong model fit, Table 3 presents the direct, indirect, and total effects of the latent constructs on academic achievement. Family support exerted the strongest direct positive effect ( $\beta = 0.69$ ,  $p < .001$ ), with an additional indirect influence through lecturer factors ( $\beta = 0.08$ ), yielding a total effect of  $\beta = 0.77$ . This highlights the central role of family in shaping student success, consistent with contexts where socio-cultural and religious values reinforce family-based educational support. Lecturer-related factors also demonstrated a significant direct effect ( $\beta = 0.30$ ,  $p < .001$ ), underscoring the importance of pedagogical practices and personality alignment in mediating student outcomes. University-related factors had a modest but significant direct effect ( $\beta = 0.16$ ,  $p < .01$ ), reflecting the supportive role of institutional resources and learning environments. Interestingly, learner-related traits showed a small negative direct effect ( $\beta = -0.07$ ), but their indirect effect via lecturer factors was positive ( $\beta = +0.12$ ), producing a total effect of  $\beta = +0.05$ . This suppression effect suggests that while certain personality traits may initially hinder achievement, effective lecturer engagement can redirect them toward positive outcomes (Hayes, 2018). In contrast, cultural-community influences demonstrated a small but significant negative effect ( $\beta = -0.09$ ,  $p < .05$ ), suggesting that when educational practices diverge from cultural or religious norms, they may modestly constrain student performance. Collectively, these findings emphasize the multi-layered nature of academic achievement in higher education, shaped by the dynamic interplay of individual, pedagogical, familial, institutional, and socio-cultural factors.

#### Measurement Reliability and Validity

To ensure the robustness of the measurement model, reliability and validity analyses were conducted for each latent construct using Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). All indices exceeded the recommended thresholds ( $\alpha \geq 0.70$ ,  $CR \geq 0.70$ ,  $AVE \geq 0.50$ ), confirming both internal consistency and convergent validity (Hair et al., 2019). Cronbach's alpha values ranged from 0.79 to 0.88, while CR values ranged between 0.82 and 0.90, indicating strong construct reliability. AVE values ranged from 0.54 to 0.62, thereby meeting the minimum criterion of 0.50 and establishing convergent validity. Among the five constructs, lecturer-related factors demonstrated the highest reliability ( $\alpha = 0.88$ ,  $CR = 0.90$ ,  $AVE = 0.62$ ), underscoring the robustness of measures reflecting teaching quality and instructor attributes. Family-related factors ( $\alpha = 0.85$ ,  $CR = 0.87$ ,  $AVE = 0.58$ ) also showed strong psychometric performance, while university-related factors yielded the lowest reliability ( $\alpha = 0.79$ ) and validity ( $AVE = 0.54$ ), though still within acceptable thresholds. Collectively, these results confirm that the measurement model is psychometrically sound and appropriate for subsequent structural equation modeling (SEM).

The structural model further demonstrated a satisfactory fit to the data, with fit indices supporting model adequacy (CFI = 0.95, IFI = 0.95, GFI = 0.92, RMSEA = 0.07, SRMR = 0.06), all of which met established criteria (Hu & Bentler, 1999; Kline, 2016). Analysis of direct and indirect effects revealed that family-related factors exerted the strongest direct influence on academic achievement ( $\beta = 0.69$ ,  $p < .001$ ), alongside a significant indirect effect through learner-related mechanisms, yielding a total effect that emphasizes the central role of family support in academic outcomes. Lecturer-related factors also had a substantial direct effect ( $\beta = 0.30$ ,  $p < .001$ ), reinforcing the importance of pedagogical practices and instructor engagement. University-related factors contributed a modest but significant positive effect ( $\beta = 0.16$ ,  $p < .01$ ), highlighting the role of institutional resources in supporting achievement. Interestingly, learner-related factors demonstrated a small negative direct effect ( $\beta = -0.07$ ) but a positive indirect effect through lecturer support ( $\beta = +0.12$ ), indicating a suppression effect in which effective teaching mitigates the potential negative influences of individual traits (Hayes, 2018). In contrast, cultural-community factors revealed a small but significant negative effect ( $\beta = -0.09$ ,  $p < .05$ ), suggesting that misalignment between cultural norms and educational practices may constrain student outcomes. Overall, these findings underscore the multidimensional and context-dependent nature of academic achievement, shaped by the dynamic interplay between individual dispositions, family, lecturers, institutional supports, and socio-cultural contexts, and align with mediation mechanisms articulated in Self-Determination Theory (Ryan & Deci, 2020).

### **Findings of the Study**

This study employed a second-order Structural Equation Model (SEM) to examine the multidimensional determinants of academic achievement, with the model demonstrating a strong overall fit ( $\chi^2/df = 2.41$ , CFI = 0.95, TLI = 0.93, IFI = 0.95, GFI = 0.92, RMSEA = 0.07, SRMR = 0.06), thereby confirming its theoretical and structural validity (Hu & Bentler, 1999; Kline, 2016). The results provided robust support for all three proposed hypotheses.

First, the analysis confirmed that both the learner's and the lecturer's personality traits significantly influenced academic achievement (H1). Learner-related factors showed a small negative direct effect ( $\beta = -0.07$ ). However, strong factor loadings for cognitive abilities (0.87), learning styles (1.00), and personality traits (1.00) underscored the enduring relevance of individual dispositions within the Big Five framework (Kim et al., 2018). More importantly, lecturer-related factors exerted a stronger positive direct effect ( $\beta = 0.30$ ), with classroom management and communication (loading = 1.00) and lecturer personality traits (loading = 1.00) as the strongest predictors, confirming the critical role of teaching quality in student outcomes (Cornelius-White, 2007; Hattie, 2009; Korpershoek et al., 2016). These findings align with Self-Determination Theory (Ryan & Deci, 2020) and Bandura's (1977) Social Learning Theory, highlighting the importance of autonomy, competence, and role modeling in shaping achievement.

Second, the hypothesis regarding interaction effects (H2) was supported. The congruence between learner dispositions and lecturer instructional qualities emerged as a significant predictor of achievement, demonstrating that alignment between student openness and lecturer adaptability fosters stronger outcomes. This confirms the mediating role of teaching-learning dynamics, consistent with instructional alignment theory (Hattie, 2009; Dunn et al., 2009). Additionally, family ( $\beta = 0.69$ ) and institutional support ( $\beta = 0.16$ ) acted as moderators, amplifying the learner-lecturer dynamic. Family support, particularly emotional encouragement (loading = 0.88) and provision of resources (loading = 0.85), emerged as the strongest determinant of achievement, underscoring ecological perspectives on education (Benner et al., 2016).

Finally, the third hypothesis (H3) was confirmed, as the SEM fit indices exceeded established thresholds (CFI > 0.90, RMSEA < 0.08, SRMR < 0.08), validating the adequacy of the

proposed second-order framework. The model integrates internal dispositions (learner and lecturer traits) with external enablers (family, university, and cultural-community influences), thereby capturing the systemic and interactive nature of academic success in higher education. Collectively, these findings reinforce the view that achievement is not the product of isolated individual traits but emerges from the interplay between personality, pedagogical quality, institutional structures, and socio-cultural contexts, in line with Bronfenbrenner's Ecological Systems Theory.

## Conclusion and Discussion

The findings of this study confirm that academic achievement is not determined by isolated traits or single environmental conditions but emerges as a multidimensional construct shaped by the dynamic interplay among learner dispositions, lecturer qualities, family engagement, institutional resources, and cultural-community contexts. The validated second-order SEM demonstrated strong model fit ( $\chi^2/df = 2.41$ , CFI = 0.95, TLI = 0.93, IFI = 0.95, GFI = 0.92, RMSEA = 0.07, SRMR = 0.06), confirming both statistical adequacy and theoretical coherence (Hu & Bentler, 1999; Kline, 2016). Within this framework, family support ( $\beta = 0.69$ ), lecturer-related factors ( $\beta = 0.30$ ), and university support ( $\beta = 0.16$ ) exerted the strongest positive effects on academic performance. By contrast, learner-related traits ( $\beta = -0.07$ ) and cultural-community influences ( $\beta = -0.09$ ) demonstrated small negative direct effects, highlighting the complexity of academic success in the Muslim-majority Southern Border Provinces of Thailand.

A critical contribution of the study lies in clarifying the suppression and mediation effects associated with learner-related traits. Although the direct path from student personality to achievement was slightly negative, mediation analysis revealed significant indirect positive effects through lecturer-related factors ( $\beta = +0.12$ , CI [.01, .18]), underscoring the potential of pedagogical engagement to redirect and transform latent learner vulnerabilities into positive academic outcomes (Hayes, 2018; Preacher & Hayes, 2008). This finding resonates with Self-Determination Theory, which emphasizes the role of autonomy support, competence feedback, and relatedness in fostering intrinsic motivation and resilience (Ryan & Deci, 2020). At the same time, the results extend the Big Five framework (McCrae & Costa, 1999) by demonstrating that conscientiousness and emotional stability, though robust predictors of achievement, operate most effectively when reinforced by lecturer engagement and family support. These dynamics echo prior meta-analyses that highlight the importance of teacher dispositions and student-centered relationships in shaping educational outcomes (Cornelius-White, 2007; Kim et al., 2018). While earlier findings by Saelim et al. (2023) established the role of lecturer-learner personality congruence, the present study shows that family and institutional supports are equally decisive, reinforcing the ecological nature of academic achievement.

Cultural-community influences presented one of the most distinctive results. Despite high factor loadings for religious values, traditions, and community leadership (0.84-0.93), their overall effect was slightly negative ( $\beta = -0.09$ ). This paradox underscores the dual role of cultural capital (Bourdieu, 1986). On the one hand, Islamic values and strong community cohesion cultivate discipline, respect, and perseverance; on the other hand, rigid adherence to tradition and limited openness to external perspectives may constrain creativity and autonomy. These findings strongly align with Bronfenbrenner's (1979) Ecological Systems Theory, in which family and lecturer interactions constitute the microsystem, university policies the mesosystem, and cultural-community influences the ecosystem, all interacting to shape student development.

From a policy and practice perspective, the study provides actionable directions for advancing SDG 4: Quality Education. Universities should strengthen digital infrastructures, inclusive

learning environments, and student support services that enable both lecturers and learners to thrive. Lecturers require targeted professional development in communication, classroom management, and culturally responsive pedagogy to maximize their positive impact (Kim et al., 2018). Families remain central in fostering emotional and financial support, creating resilience and intrinsic motivation. At the same time, community and religious leaders should be engaged as partners to ensure cultural traditions act as bridges rather than barriers to learning. Such strategies will enhance inclusivity and sustainability in education, particularly in multicultural contexts like Southeast Asia.

In conclusion, this study demonstrates that academic achievement in higher education is a synergistic process where individual traits are moderated, amplified, or suppressed by external supports. The second-order SEM not only validates existing theories such as the Big Five, Self-Determination Theory, and Ecological Systems Theory, but also contextualizes them within a predominantly Muslim, resource-constrained environment. By integrating learner, lecturer, family, institutional, and cultural factors into a systemic framework, the study contributes to the global discourse on sustainable higher education. It offers evidence-based pathways for achieving SDG 4 in the Thai Southern Border Provinces and beyond.

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