Factors Influencing Academic Performance: A Structural Equation Modeling Analysis among Undergraduate Foreign Language Majors in Western China

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Abstract

This article aimed to examine the causal relationships among the learning environment, self-efficacy, social support, student engagement, and academic performance of undergraduate foreign language majors in Western China, particularly in Sichuan Province, to address regional disparities in higher education development. The sample consisted of 479 undergraduates from schools of foreign languages at three universities in Chengdu, Sichuan Province, who were selected through stratified cluster random sampling. The instrument used for data collection was a questionnaire composed of five subscales, including learning environment, self-efficacy, social support, student engagement, and academic performance. Data analysis employed descriptive statistics and structural equation modeling to examine both direct and indirect relationships among the variables. A Confirmatory Factor Analysis (CFA) was used to validate the three latent constructs, demonstrating high reliability (factor loadings ≥ 0.70, AVE ≥ 0.5, and CR ≥ 0.70). The results of structural equation modeling analysis confirmed that the proposed model demonstrated an excellent fit with the empirical data (χ^2 = 2626.821, df = 2404, χ^2/df = 1.093; RMSEA = 0.014, RMR = 0.037; CFI = 0.991, NFI = 0.907, IFI = 0.991, TLI = 0.991; GFI = 0.871, AGFI = 0.863). The results of structural equation modeling showed that learning environment (β = 0.240, $p < 0.001$), self-efficacy (β = 0.212, $p < 0.001$), and social support (β = 0.261, $p < 0.001$) all had significant positive effects on student engagement. In addition, Learning Environment (β = 0.266, $p < 0.001$), Student Engagement (β = 0.129, $p < 0.001$), Self-Efficacy (β = 0.215, $p < 0.01$), and Social Support (β = 0.214, C.R. $p < 0.001$) exerted significant positive effects on

Academic Performance. The mediation analysis results indicated that student engagement played a partial mediating role in the relationships between the learning environment and academic performance (β = 0.031, $p < 0.01$), self–efficacy and academic performance (β = 0.027, $p < 0.01$), and social support and academic performance (β = 0.034, $p < 0.01$). These findings suggest that while environmental and psychological factors directly influence academic performance, their effects are also partially transmitted through student engagement, highlighting its critical role in the learning process.

Keywords: Student Engagement; Academic Performance; Foreign Language Education; Western China Higher Education; Structural Equation Model

Introduction

Driven by the mass expansion of global higher education, opportunities for university entry have increased significantly. However, expansion in enrollment has not resulted in an improvement in the quality of student learning in higher education institutions. An OECD report in 2019 pointed out that although some students successfully obtain degrees, they still remain at relatively low levels in basic competencies such as literacy and numeracy and are unable to meet labor market requirements. Since the expansion of higher education in China in 1999, enrollment has continued to increase, and the gross enrollment rate of higher education has exceeded 60 percent (Ministry of Education of the People's Republic of China, 2025). With the sharp rise in the number of individuals entering universities worldwide, research by Kocsis and Molnár (2025) indicates that university dropout rates in many countries have consistently remained at relatively high levels. Many university students experience the situation of being able to enter university but failing to learn effectively and struggling to complete their studies. These conditions indicate that contemporary university students' academic performance is not merely a matter of whether they study, but also a matter of how they study and how learning can be effectively promoted. These issues continue to require extensive research in order to identify key solutions.

As a major province in western China, Sichuan hosts a considerable number of universities and enrolled students. However, according to statistics from education authorities, institutions included in the national Double First Class initiative show a spatial distribution characterized by a higher concentration in eastern regions and a lower concentration in western regions. In terms of high–quality higher education resources, teaching conditions, and learning support systems, western regions are generally weaker than the more developed eastern regions (MOE, 2022).

Yang Yongying, a member of the Standing Committee of the National People's Congress, also pointed out this issue and emphasized that the relatively small number of Double First Class universities and disciplines in western China is unfavorable to high quality regional development (Wang, 2024). In fact, large scale surveys based on universities in Sichuan show that students in this region exhibit prominent problems in sustained engagement and academic performance similar to those observed among students nationwide. Many undergraduates demonstrate only moderate levels of extracurricular study time, classroom concentration, and learning engagement. However, despite these structural disparities, limited research has specifically examined how undergraduate students in foreign language programs respond to these contextual challenges, particularly in relation to labor market demands and skill requirements in western China. This highlights the necessity of focusing on foreign language majors as a critical group within this regional context.

In order to address the problem of low academic performance among contemporary university students, the author set the investigation of mechanisms influencing academic performance as a research objective in 2025. Taking Sichuan Province in western China as the research region, this study focuses on undergraduate students from schools of foreign languages at three universities in Sichuan Province. Previous researchers have also examined academic performance; however, according to the author's review, most existing studies have examined only one or two influencing factors and lack a causal model that integrates multiple factors within a unified framework to systematically explain university students' academic performance. In addition, although prior studies have explored factors influencing academic performance, they often fail to establish a clear theoretical linkage between environmental conditions and meaningful student development. Drawing upon the Input–Environment–Outcome (I–E–O) model proposed by Astin, this study emphasizes the role of the learning environment as a key mechanism that may help shift student learning from utilitarian goals toward more meaningful academic engagement and development.

Even when causal models have been proposed, the research contexts have generally not been located in western regions of China such as Sichuan Province. Therefore, this study aims to construct and test a causal model of university students' academic performance that integrates learning environment, self–efficacy, social support, and student engagement. The study focuses on analyzing the direct and indirect effects of these factors on the academic performance of undergraduate students in schools of foreign languages in universities in Sichuan Province. Structural equation modeling is employed to examine the relationships among variables in

accordance with the research objectives. Based on the research background, theoretical foundations, and data analysis results, the findings are discussed in order to provide empirical evidence for understanding the formation mechanisms of academic performance among university students in western China and to offer reference for practical strategies aimed at improving students' academic development in higher education institutions.

Research Objectives

1. To examine the direct effects of learning environment, self-efficacy, and social support on student engagement and academic performance

2. To investigate the mediating role of student engagement in the relationships between these factors and academic performance

Literature Review

Astin (1993) proposed the Input Environment Outcome model. Input refers to students' backgrounds at the time of university entry. Environment refers to the educational environments and experiences that students encounter during their time in university. Outcome refers to the various forms of development that students achieve after undergoing the process of higher education. These theories consistently indicate that academic achievement does not merely refer to students' test scores, and that students' academic performance is shaped through the combined influence of multiple factors.

In this study, the Input–Environment–Outcome (I–E–O) model is used as the primary theoretical framework to explain how learning environment (Environment), individual psychological factors such as self-efficacy (Input), and academic performance (Outcome) are systematically linked, thereby providing a clear theoretical foundation for the proposed structural model.

A review of the literature shows that student engagement frequently appears in studies of academic performance. Astin (1984) provided a classic definition of student engagement as the amount of physical and psychological energy that students devote to the academic experience. He argued that how well students learn and how much they develop fundamentally depend on how much physical and mental energy they invest in their educational experiences. Ultimately, the effectiveness of any educational policy, curriculum design, or management measure should be judged by whether it genuinely leads students to spend more time, engage in deeper thinking, and participate more actively in learning activities (Astin, 1984). Fredricks et al. (2004) further

explained that under similar environments, some students persist in effort and achieve better outcomes while others gradually disengage from school, largely because of differences in student engagement. Chinese scholar Yang (2015) also emphasized that enhancing classroom participation, increasing time spent on extracurricular learning, and promoting deep learning behaviors are key approaches to improving the quality of undergraduate education and fostering academic success.

A substantial body of literature also identifies the learning environment as an important factor influencing academic performance. Fraser (1998) likewise found that after controlling for factors such as family background, classroom and school environments remained significant predictors of academic performance. Lizzio et al. (2002) examined learning environment, approaches to learning, and learning outcomes within a unified structural equation model and found that even after controlling for prior academic preparation, the university learning environment still exerted an additional effect on academic performance.

Self–efficacy has also been extensively examined in studies of academic performance. Schunk (1985) applied Bandura's concept of self–efficacy to classroom learning contexts and argued that students' self–efficacy judgments are critical determinants of learning motivation and classroom behavior. He noted that many students abandon learning tasks not because of insufficient ability but because they lack confidence in their capacity to succeed. Using a sample of university students, Dogan (2015) found that self–efficacy significantly predicted academic achievement even after controlling for variables such as student engagement. In China, Meng and Zhang (2023) similarly found that academic self–efficacy not only directly predicted students' academic achievement but also indirectly predicted achievement by enhancing student engagement.

Similarly, social support is frequently discussed in studies of academic performance. Cobb (1976) defined social support as information that leads individuals to believe that they are loved, valued, and part of a network of mutual obligation. Subsequent research by Lamothe et al. (1994) further emphasized the role of social support during the transition to university, suggesting that students who receive social support gain greater academic and social benefits. Cutrona (1994) and colleagues also demonstrated that social support does not merely function as emotional comfort but can translate into tangible differences in academic achievement by shaping students' beliefs about their academic capabilities. In 2020, Mishra further pointed that social support provided by

families, communities, peers, teachers, and learning groups can all influence academic performance (Mishra, 2020).

Overall, prior studies have primarily examined these variables independently or in limited combinations, and there remains a lack of integrated causal models that simultaneously explain how learning environment, self-efficacy, and social support jointly influence academic performance through student engagement, particularly in the context of western China. This gap provides the foundation for the present study.

With regard to the learning environment, Shernoff (2013), in the OLEOLA study, proposed the concept of environmental complexity, which is composed of classroom challenge, support, interpersonal interaction, feedback, and positive relationships. The findings showed that environmental complexity as a comprehensive indicator of the learning environment significantly predicted students' engagement in the classroom. Shernoff argued that classrooms characterized by both challenge and support constitute an optimal environment for fostering high levels of academic engagement. Salta et al. (2022) compared changes in students' emotional engagement and interaction across traditional classroom and online environments and found that undergraduates demonstrated significantly higher emotional engagement in traditional settings. Interpersonal interaction was also consistently stronger in traditional environments across four learning communities. The authors concluded that changes in interpersonal interaction driven by learning environments were a key mechanism underlying variation in students' emotional engagement.

With respect to self-efficacy, at the classroom level, Sökmen (2019) examined the multidimensional relationships among learning environment, self-efficacy, and student engagement within the context of science classes among Turkish secondary school students. The results showed that self-efficacy positively predicted student engagement, and that higher levels of self-efficacy enhanced behavioral engagement, positive emotions, and strategy use in science learning (Sökmen, 2019). Using a sample of university students in Chongqing, Zhou (2023) constructed a regression model linking self-efficacy and learning engagement. The findings indicated that students who were more confident in their ability to complete both online and offline tasks demonstrated higher login frequency on blended learning platforms, more active classroom participation, deeper information processing, and were more likely to experience positive emotions during learning (Zhou, 2023).

Based on the above research, learning environment, self-efficacy, and social support can all be regarded as important factors influencing student engagement, whereas student engagement functions as a mediating variable, and academic performance acts as the dependent variable. Accordingly, this study proposes a comprehensive structural model in which learning environment, self-efficacy, and social support function as antecedent variables, student engagement serves as a mediating mechanism, and academic performance represents the outcome variable, thereby aligning theoretical constructs with the empirical model. The following sections will systematically examine these relationships using undergraduate students from schools of foreign languages in universities in Sichuan Province as the research sample (Figure 1).

Conceptual Framework

Based on the research objectives and literature review, the following research hypotheses are proposed:

H1: Learning environment has a direct positive effect on student engagement.

H2: Self-efficacy has a direct positive effect on student engagement.

H3: Social support has a direct positive effect on student engagement.

H4: Learning environment has a direct positive effect on academic performance.

H5: Student engagement has a direct positive effect on academic performance.

H6: Self-efficacy has a direct positive effect on academic performance.

H7: Social support has a direct positive effect on academic performance.

H8: Student engagement mediates a relationship between learning environment and academic performance.

H9: Student engagement mediates a relationship between self-efficacy and academic performance.

H10: Student engagement mediates a relationship between social support and academic performance.

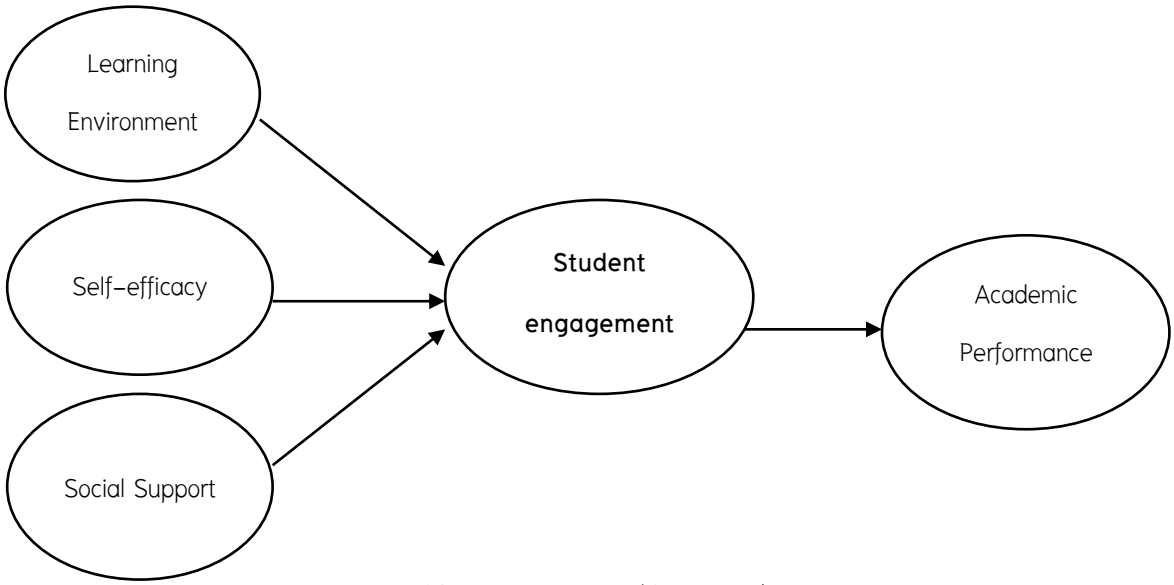


Figure 1 Conceptual Framework

Research Methodology

Research subjects and sample

This study takes undergraduate students currently enrolled in the schools of foreign languages at three universities in Sichuan Province as the research subjects, including Sichuan University, the University of Electronic Science and Technology of China, and Southwest Jiaotong University. According to statistical data provided by the academic affairs offices of the three universities, the total number of undergraduate students in the schools of foreign languages is approximately 1,875. Among them, students from Sichuan University, the University of Electronic Science and Technology of China, and Southwest Jiaotong University account for 19.7 percent, 25.6 percent, and 54.6 percent, respectively.

These universities represent a mix of national "Double First-Class" institutions and key regional universities, which helps capture variation in learning environments and improves the representativeness of the sample.

Based on an a priori statistical power analysis for structural equation modeling, with the effect size set at 0.20, the significance level alpha set at 0.05, statistical power set at 0.80, and a model including five latent variables and twenty-four observed variables, the minimum required sample size was calculated to be 376. According to the empirical rule that each observed variable should be supported by no fewer than ten samples, the minimum sample size should not be less than 240. A total of 479 valid questionnaires were finally collected, meeting and exceeding both criteria.

The sampling procedure followed a stratified cluster random sampling technique, in which students were first grouped by university and academic year, and then randomly selected within each cluster to ensure proportional representation.

The distribution of the sample across the three universities was generally consistent with the population structure, indicating adequate statistical sufficiency.

Questionnaire instrument

This study employed a structured questionnaire to measure five core variables, namely learning environment, self-efficacy, social support, student engagement, and academic performance. The scale items were mainly adapted from well-established instruments developed in both domestic and international studies and were revised to fit the contextual characteristics of schools of foreign languages in universities in Sichuan Province.

Specifically, items related to student engagement were adapted from established engagement scales such as NSSE-related frameworks, while self-efficacy items were grounded in Bandura's theoretical constructs, and social support items were derived from prior empirical studies on higher education contexts.

The questionnaire adopted a five-point Likert scale, with 1 indicating strongly disagree and 5 indicating strongly agree. Higher scores represent higher levels of the corresponding characteristics.

To ensure linguistic and contextual appropriateness, the questionnaire was translated into Chinese and then back-translated into English by bilingual experts to maintain semantic equivalence.

Reliability and validity testing

Content validity of the questionnaire was examined using the item objective congruence index, which was evaluated by five experts in relevant fields. The item objective congruence values for all items were greater than 0.6, indicating good content validity.

These experts included specialists in educational research, applied linguistics, and quantitative methodology, ensuring that the instrument adequately reflected both theoretical constructs and contextual relevance.

Internal consistency reliability was assessed using Cronbach's alpha coefficient. The overall alpha value of the scale was 0.975, which is substantially higher than the recommended threshold of 0.70, demonstrating high reliability.

The Kaiser Meyer Olkin value was 0.976, and the Bartlett test of sphericity was significant at $p < 0.001$, indicating that the data were suitable for factor analysis and that the overall structural validity was satisfactory.

In addition, Confirmatory Factor Analysis (CFA) was conducted to further validate construct validity, including convergent and discriminant validity of the latent variables.

Data analysis methods

Data analysis was conducted using SPSS and AMOS software. First, SPSS was used for data cleaning, descriptive statistics, and correlation analysis. Subsequently, AMOS was used to perform confirmatory factor analysis and structural equation model estimation in order to examine the path relationships among latent variables and the mediating effects.

Structural equation modeling was specifically employed to test both direct and indirect effects simultaneously, allowing for a comprehensive examination of the hypothesized causal relationships among variables.

Research Results

The samples in this study consisted of 198 males (41.34%) and 281 females (58.66%). Most respondents were aged 19–21 years (70.98%), followed by 22–24 years (19.42%). In terms of institutional affiliation, 55.32% were from Southwest Jiaotong University, 25.26% from the University of Electronic Science and Technology of China, and 19.42% from Sichuan University (Table 1). These demographic characteristics indicate that the sample is appropriately distributed across gender, age, and institutional representation, supporting the adequacy and generalizability of the data within the context of foreign language students in Sichuan Province.

Table 1 Number and percentage of respondents classified by personal information

(n = 479)

Personal factors	frequency	percentage
Gender		
Male	198	41.336
Female	281	58.664
Age		
16–18 years	0	0
19–21 years	340	70.981
22–24 years	93	19.415
25 years or above	46	9.603
University		
Sichuan University	93	19.415
University of Electronic Science and Technology of China	121	25.261
Southwest Jiaotong University	265	55.324

Measurement Model

Convergent validity was assessed using the average variance extracted (AVE) and composite reliability (CR). The AVE and CR values for Learning Environment (LE) are 0.595 and 0.954; for Student Engagement (ENG), 0.617 and 0.935; for Self–Efficacy (SEF), 0.619 and 0.961; for Social Support (SS), 0.611 and 0.959; and for Academic Performance (AP), 0.635 and 0.969. All AVE values exceed 0.50 and all CR values exceed 0.70, indicating satisfactory convergent validity for all latent constructs (Table 2). These results confirm that all constructs demonstrate strong internal consistency and that the observed variables adequately represent their respective latent variables.

Table 2 Average variance extracted (AVE) and composite reliability (CR) for latent variables

Factors	AVE	CR
Learning Environment	0.595	0.954
Student Engagement	0.617	0.935
Self–Efficacy	0.619	0.961
Social Support	0.611	0.959
Academic Performance	0.635	0.969

Discriminant validity

Discriminant validity was assessed using the Fornell–Larcker criterion by comparing the square root of the AVE for each latent construct with its correlations with other constructs. Table 3 presents the correlation matrix of the five latent variables, with the square roots of AVE reported on the diagonal. The results show that the square roots of AVE for Learning Environment, Student Engagement, Self–Efficacy, Social Support, and Academic Performance are 0.772, 0.785, 0.787, 0.782, and 0.797, respectively, all of which are greater than their correlations with other latent constructs, indicating that the Fornell–Larcker criterion is satisfied and that the latent constructs exhibit adequate discriminant validity (Table 3). This suggests that each construct is empirically distinct and captures a unique dimension of the conceptual model.

Table 3 Correlation matrix of latent variables and square roots of AVE

	Learning Environment	Student Engagement	Self–Efficacy	Social Support	Academic Performance
Learning Environment	**0.772**				
Student Engagement	0.444	**0.785**			
Self–Efficacy	0.449	0.447	**0.787**		
Social Support	0.419	0.465	0.490	**0.782**	
Academic Performance	0.509	0.443	0.497	0.490	**0.797**

Structural model analysis

The structural model was used to examine the hypothesized causal relationships among the five latent variables in the causal model of academic performance. All indices meet or exceed the recommended thresholds, indicating a good fit of the structural model with χ^2 = 2626.821, df = 2404, χ^2/df = 1.093, RMSEA = 0.014, RMR = 0.037, CFI = 0.991, NFI = 0.907, IFI = 0.991, TLI = 0.991, GFI = 0.871, and AGFI = 0.863 (Table 4). Although the values of GFI (0.871) and AGFI (0.863) are slightly below the commonly recommended threshold of 0.90, they are still considered acceptable for complex structural equation models with large sample sizes, as supported by previous studies.

Table 4 Model fit indices

Fit Index	criterion	Value
χ^2	–	2626.821
df	–	2404
χ^2/df	< 3	1.093
CFI	> .90	0.991
IFI	>0.9	0.991
TLI	> .90	0.991
NFI	>0.8	0.907
GFI	>0.8	0.871
AGFI	>0.8	0.863
SRMR	< .08	0.037
RMSEA	< .07	0.014

Note: GFI and AGFI values are within an acceptable range for model fit in large and complex SEM models.

The results of structural equation modelling indicated that Learning Environment (β = 0.240, p< 0.001), Self–Efficacy (β = 0.212, p< 0.001), and Social Support (β = 0.261, p< 0.05) all have significant positive effects on Student Engagement. Among these variables, Social Support shows the strongest effect on Student Engagement, indicating the importance of interpersonal and institutional support in promoting active learning engagement. In addition, Learning Environment (β = 0.266, p< 0.001), Student Engagement (β = 0.129, p< 0.001), Self–Efficacy (β = 0.215, p< 0.01), and Social Support (β = 0.214, C.R. p< 0.001) all exert significant positive effects on Academic Performance. The results further reveal that Learning Environment has the strongest direct influence on Academic Performance, highlighting the critical role of institutional and classroom conditions in shaping student outcomes. These findings indicate that enhancing the quality of the learning environment, strengthening students' self–efficacy, and providing adequate social support contribute to higher levels of student engagement, which in turn serves as a critical mechanism for improving academic performance among university students, with all effects reaching statistical significance at the .05 level. Therefore, the causal model of academic performance constructed using undergraduate students from schools of foreign languages in universities in Sichuan Province as the research sample is supported (Table 5).

Table 5 Standardized path coefficients and hypothesis testing results

Hypotheses	Path	β	T-value	P-value
H1	LE⟶ENG	0.240	4.861	0.000***
H2	SEF⟶ENG	0.212	4.161	0.000***
H3	SS⟶ENG	0.261	5.162	0.000***
H4	LE⟶AP	0.266	2.733	0.000***
H5	ENG⟶AP	0.129	5.626	0.006**
H6	SEF⟶AP	0.215	4.483	0.000***
H7	SS⟶AP	0.214	4.476	0.000***
H8	LE⟶ENG⟶AP	0.031	3.336	0.000***
H9	SEL⟶ENG⟶AP	0.027	4.153	0.000***
H10	SS⟶ ENG⟶AP	0.034	3.557	0.000***

***p<0.001

Discussions

The results of structural equation modelling indicated that learning environment had a direct positive effect on student engagement, meaning that the learning environment influences learning engagement. This result is also related to the conclusion proposed by Fraser (1998), who suggested that goal structures, interaction patterns, and supportive climates in classrooms and learning environments directly affect the level and persistence of students' participation in learning activities. This suggests that, in the context of undergraduate foreign language students, the learning environment is not merely an external background, but rather a key condition that directly determines whether students enter the learning process. This finding further implies that in the context of western China, where educational resources are relatively uneven, improving the quality of the learning environment may play a critical role in reducing disparities in student engagement and learning outcomes.

Self-efficacy had a positive direct effect on student engagement. Based on Bandura's self-efficacy theory (1997), self-efficacy represents students' beliefs about their ability to complete learning tasks, and such beliefs influence effort and persistence. Therefore, self-efficacy directly promotes student engagement. The results of this study are consistent with Bandura's view, and self-efficacy can be understood as translating ability beliefs into observable differences in learning engagement. In addition, this result highlights that students with higher self-efficacy are more likely to sustain engagement even under challenging learning conditions, suggesting that psychological factors can partially compensate for limitations in external learning environments.

The results of the study showed that learning environment had a positive effect on academic performance. This result is consistent with the findings of Wayne et al. (2013), who reported that students with higher evaluations of their learning environment perform significantly better on standardized tests. It can therefore be inferred that, for students in schools of foreign languages within the Sichuan context, the learning environment is the most important factor directly influencing academic performance. This finding also suggests that institutional improvements, such as enhancing classroom interaction, feedback mechanisms, and curriculum design, may have immediate and measurable impacts on student achievement.

The results of this study showed that student engagement has a statistically significant direct effect on academic performance. This finding is consistent with the conclusions of Astin (1984), indicating that the time, effort, and psychological energy students invest in learning activities influence the formation of learning outcomes. It is also consistent with the conclusions of Lei, Cui, and Zhou (2018), which confirm that there is a stable and statistically significant positive relationship between student engagement and academic achievement. In the context of higher education institutions in Sichuan, whether undergraduate students in foreign language programs continuously participate in learning activities and engage in deep cognitive processing is an important factor distinguishing differences in academic performance. This reinforces the view that student engagement is not only an outcome of educational processes but also a key mechanism through which learning inputs are transformed into academic achievement.

Self–efficacy had a direct positive effect on academic performance. This result indicates that, after controlling for the effects of other variables, namely student engagement and learning environment, self–efficacy still exerts a substantial influence on academic performance. This finding is also consistent with Zimmerman (2000) and Wongmajarapinya et al. (2024) who pointed out that self–efficacy directly affects learning performance by influencing goal setting, learning strategies, and self–regulation processes. Furthermore, the coexistence of direct and indirect effects suggests that self–efficacy contributes to academic performance through multiple pathways, both by enhancing engagement and by directly influencing students' learning behaviors.

New Knowledge from Research

Based on the empirical analysis results of this study, first, academic performance is not determined solely by achievement scores, but is a comprehensive outcome variable that encompasses academic achievement, attainment of learning objectives, acquisition of professional competencies, application of knowledge, academic satisfaction, and progress relative to peers. Therefore, when evaluating university students' academic performance, focusing only on examination results or GPA is likely to underestimate the influence of the learning process and learning experiences on student development. This study contributes to the literature by redefining academic performance as a multidimensional construct, thereby extending traditional evaluation approaches that rely primarily on examination–based indicators.

Second, learning environment, self–efficacy, and social support play foundational roles in students' academic development. The learning environment, including physical learning spaces, digital learning resources, clarity of curriculum structure, and the overall learning atmosphere, provides essential external conditions for students' participation in learning activities. Self–efficacy reflects students' confidence and judgments in completing academic tasks, coping with learning challenges, and regulating academic stress. Social support, through forms such as emotional support, informational support, and peer networks, provides external resources and psychological assurance for students' sustained engagement in learning. Although these three factors differ in nature, they all create favorable conditions for students' learning activities. This finding highlights a key theoretical contribution by integrating environmental, psychological, and social factors into a unified framework, rather than examining these variables in isolation as in many previous studies.

Further analysis indicates that student engagement plays a critical connecting role between the above factors and academic performance. The levels of students' behavioral, emotional, and cognitive engagement reflect whether they truly participate in the learning process. The results show that a more supportive learning environment, higher levels of self–efficacy, and more adequate social support are often accompanied by higher levels of student engagement, and higher student engagement in turn further promotes improvements in academic performance. This suggests that external conditions and individual resources do not automatically translate into learning outcomes, but must exert their effects through students' actual participation in the learning process. More importantly, this study empirically confirms that student engagement functions as a partial mediating mechanism, providing a clearer explanation of how and why these factors influence academic performance.

This finding indicates that, in real educational contexts, even when levels of student engagement differ, the quality of the learning environment, the level of self–efficacy, and the support system itself can still exert independent influences on students' academic development. This dual–path effect (direct and indirect influence) represents an important empirical contribution, as it demonstrates that academic performance is shaped by multiple interacting mechanisms rather than a single linear process, particularly within the context of higher education in western China.

Conclusion

This study takes undergraduate students majoring in foreign languages in universities in Sichuan Province as the research population and empirically examines the relationships among learning environment, self–efficacy, social support, student engagement, and academic performance. The results indicate that learning environment, self–efficacy, and social support all have statistically significant positive effects on student engagement and academic performance. Student engagement plays a partial mediating role between the above factors and academic performance, confirming that academic performance is the result of the joint influence of multiple factors. These findings provide empirical support for a multidimensional and integrated model of academic performance, demonstrating that both direct and indirect pathways contribute to student outcomes. It is affected not only by external factors such as learning environment and support conditions, but also constrained by students' own levels of learning engagement. Therefore, in promoting the academic development of university students majoring in foreign languages, emphasizing individual effort alone is insufficient. It is also necessary to simultaneously improve learning environment conditions, enhance students' self–efficacy, and construct a stable social support system. In particular, for universities in western China, targeted strategies such as enhancing classroom interaction, strengthening academic support services, and fostering collaborative learning environments may be especially effective in improving student engagement and academic outcomes.

Suggestions

This study has several limitations. First, the sample includes only undergraduate students majoring in foreign languages from three universities in Sichuan Province, which imposes certain regional and disciplinary constraints, and the generalizability of the findings requires further examination. In particular, the focus on foreign language majors may limit the applicability of the

findings to other academic disciplines with different learning environments and assessment structures.

Second, although the relationships and statistical significance among variables can be tested, it is difficult to reveal the dynamic changes and potential bidirectional effects between student engagement and academic performance, and the results may be influenced by social desirability bias. Additionally, the cross-sectional design of this study restricts the ability to infer causal directionality over time, which may oversimplify the complex interactions among variables.

In addition, differences in curriculum design and evaluation systems across universities may also affect the measurement of academic performance. These institutional differences may introduce measurement variability, suggesting that future studies should consider more standardized or multi-dimensional indicators of academic performance.

Future research may test the stability of the proposed model in a wider range of regions, types of institutions, and disciplinary contexts, and further examine the moderating effects of contextual factors. Future studies are also encouraged to incorporate comparative analyses between eastern and western regions of China to better understand regional disparities in higher education outcomes.

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