Flow Experience in the Chinese Blended Classroom: How Students and Teachers Shape English Success

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Abstract

While blended learning has become increasingly institutionalised in Chinese higher education, low academic performance in English and limited participation in English-Medium Instruction (EMI) environments remain significant concerns. Although much has been researched on technological integration and linguistic challenges, little research has examined the interaction of student- and teacher-related factors to foster a flow experience and, subsequently, improve academic performance in English. This research is based on the Flow Theory (Csikszentmihalyi, 1990), which examines direct and mediated relationships among student and teacher factors, flow experience, and English academic performance within a Chinese blended classroom context. The sample data were gathered from 165 non-English majors, both first- and second-year undergraduates enrolled in mandatory College English classes, using purposive sampling. A structured questionnaire comprising 38 questions was developed and administered, and the data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results show that student- and teacher-related factors have significant positive direct effects on English academic performance. The results of the flow experience are notably large and positive, and flow experience partially mediates the relationships between students' and teachers' factors and academic outcomes. The findings provide empirical support for the challenge-skill balance hypothesis of Flow Theory, demonstrating how the joint influence of the learners' capabilities and the instructional requirements leads to optimal psychological involvement. The study contributes to existing knowledge by incorporating variables related to learners and instruction into a single structural model, which will help understand how psychological immersion can be applied to English language success within a blended higher education setting.

Keywords: Education, Educational environment, Flow experience, Student factors, Teacher factors, Blended classroom

1. Introduction

Over the past few years, the inclusion of technology in language learning has brought an important shift to the education system of higher learning institutions in China. The blended classroom, which combines face-to-face teaching and online learning, has become a widely adopted approach in teaching English at universities (Atwa et al., 2022). In China, where English is not commonly used in everyday life, there are growing concerns that students' limited academic English proficiency creates significant barriers to academic success. These issues may remain unresolved because English Medium Instruction (EMI) does not explicitly focus on English language acquisition, and many content instructors do not perceive language support as part of their instructional responsibilities (Yu et al., 2025; Zhou et al., 2022).

Language issues encountered by students in higher education programs taught in English are most evident in productive skills, particularly writing. Zhou et al. (2022) reveal that students face major challenges when completing academic writing assignments, which negatively affects their ability to write clearly, concisely, and in a well-structured manner. Previous studies further indicate that students experience difficulties not only in writing but also in reading, listening and speaking (Hu & Wu, 2020). According to Jiang et al. (2019), students often struggle to make sense of complex academic texts and to engage effectively in oral classroom discussions.

Even though blended English instruction has been widely used in higher education in China, students' academic performance remains unsatisfactory. It is still observed in large-scale reviews and empirical studies that a high number of Chinese university students are unable to achieve satisfactory English proficiency levels even after several years of formal school and university instruction in English (Islam et al., 2025; Zhu, 2022). Despite this change in pedagogy, Chinese students have still not achieved satisfactory levels of English proficiency, particularly in productive skills and in high-stakes assessments such as the College English Test Band 4 (CET-4), where concerns about relatively low or stagnant pass rates have been expressed in various institutional and empirical reports (Hou, 2024; Luo, 2013). Simultaneously, the results of blended and SPOC-based English courses indicate that students tend to report a lack of engagement, a low continuance intention, and difficulty maintaining engagement between online and face-to-face components (Huang, 2022; Jiang, 2023;

Qian, 2023). More qualitative research on blended college English courses also demonstrates that educators must often take active steps just to ensure that learners are motivated and engaged, and it is important to note that the engagement in blended classrooms is not simply an automatic result of introducing technology but a consistent issue in pedagogy (Peng, 2021; Xu, 2024). These issues further indicate that limited academic English proficiency, coupled with the lack of linguistic support in EMI classes, still hinders students' ability to engage effectively in both online and face-to-face aspects of learning and propose that structural adaptations to instructional delivery are inadequate without classroom conditions being able to support meaningful ongoing engagement (Taddese et al., 2025; Chen, 2024).

The synergistic effect of student- and teacher-related factors, as observed in blended English-language classrooms in Chinese universities, is critical in shaping learners' academic performance. From the students' perspective, participation, enthusiasm, ability to self-regulate, and desire to be actively involved determine how effectively students will utilise both online and face-to-face learning opportunities. Instructional clarity, timely feedback, scaffolding strategies, and the establishment of a favourable classroom climate play a crucial role in helping students cope with the linguistic demands in blended environments. Current research highlights the importance of learners' affective and cognitive engagement in blended settings, the close link between these two variables, the quality of instructors' interaction, and students' perceptions of the tasks as purposeful and controllable (Tang et al., 2023). In such a pedagogical dynamic, the phenomenon of flow experience has emerged as a key construct that explains why some learners excel in blended English teaching while others do not. Flow is a state of intense engagement, full attention, and the most effective level of difficulty and ability, which allows students to find meaningful learning activities (Wang and Huang, 2022). Studies of the Chinese EFL environment indicate that flow promotes active persistence, facilitates participation, and enhances language performance, especially when digital and face-to-face activities are integrated (Wang et al., 2022). The attainment of flow, however, becomes even more challenging when students develop a sense of linguistic insecurity or when teachers lack linguistic scaffolding. The absence of specific linguistic support and the mental load imposed by the decoding of more complex academic materials are crucial factors that reduce the likelihood that Chinese students in EMI programmes will enter a state of flow (Mao et al., 2024). Though the available literature has explored blended learning strategies, technological integration, and the linguistic challenges faced by students in the EMI setting, few studies have examined the interactive effects of student- and teacher-related factors in developing a flow experience in the Chinese English blended classroom. Most previous studies have tended to work with independent variables, even those related to students (e.g., student engagement) or teachers (e.g., instructional design), without examining the interactions between variables concerning their roles in influencing learner capacity to experience flow (Tang et al., 2023; Wang et al., 2022). This is a particularly important gap, as blended instruction is becoming an essential part of the Chinese higher education system, and students are increasingly expected to demonstrate high levels of academic proficiency in English despite a lack of linguistic support in EMI environments. Thus, the present study aims to fill this gap by examining the roles of student- and teacher-related variables in the flow experience in the Chinese blended classroom, and the role of the flow experience in learners' English academic achievement.

2. Literature Review

2.1 Student Factors and Academic Performance

The current literature on student-related factors and academic performance consistently emphasises that learners' personal dispositions, behavioural tendencies, and lived experiences shape the foundations of their academic success. Across the reviewed literature, motivation is one of the main psychological concepts that can stimulate engagement, support effort, and guide students in overcoming academic obstacles (Le Thai Hung et al., 2025). There is a consistent presentation of motivation as a dynamic process rather than a fixed personal attribute, as an internal force that enables students to pursue academic achievement goals with purpose and persistence. This is closely associated with learning persistence, a behavioural manifestation of motivation that enables students to maintain focus, handle setbacks, and remain committed despite the pressures of academic work. Persistence, therefore, supports the notion that good learning is not just a cognitive exercise but a process based on endurance and requiring a sustained behavioural investment over time (Le Thai Hung et al., 2025). Simultaneously, the literature presents learning approaches and study habits as necessary processes by which students can create, internalise, and use knowledge. Although their impact appears to be less pronounced among Vietnamese high-school students, other researchers believe that well-developed learning strategies, including time management, effective note-taking, and reflective study routines, give students the structural support they need to immerse themselves in the curriculum requirements, particularly in increasingly complex and technology-enhanced learning environments (Lopez, 2025). Prior academic performance has consistently been identified in the literature as an important predictor of future academic success. It reflects students' learning history, background competencies, and academic preparedness, which they carry into a new educational environment. Research based on universities demonstrates that prior performance can easily lead to self-efficacy, academic identity, and the establishment of trajectory patterns that may either enable or inhibit further performance (Lopez, 2025). Previous studies, such as Devaraje Urs & Sudharshan (2025) and Hsieh (2025), have also highlighted the potential influence of contextual factors, such as socioeconomic conditions and financial stress, on academic outcomes. However, the present study focuses primarily on learner-related motivational, self-regulatory, and proficiency-related characteristics.

2.2 Teacher-Related Factors and Academic Performance

The relationship between teacher factors and students' academic performance has been the focus of much research, and there is strong evidence that teachers play a vital role in shaping students' achievement. Empirical research shows that teacher-related variables explain a significant share of the variance manifested in the academic performance of students, with the share of variance accounted for reported to range from around 9% to close to 60%, depending on the contextual and methodological specificities (Lopez-Martin et al., 2021;

Wenglinsky, 2002). These results underscore the importance of teachers not only as conveyors of knowledge but also as active agents shaping instructional quality, student engagement, and academic performance.

Among factors related to teachers, instructional practices have emerged as the most consistent predictor of academic performance. Studies reveal that teaching strategies that encourage active learning, problem-solving and student-centred learning are highly correlated with improved academic performance. Wenglinsky (2002) used nationally representative data and found that classroom instructional practices had an effect size as large as students' socioeconomic background, highlighting the significant impact of teaching methods on achievement. Fehintola et al. (2014) also reported significant positive relationships between teachers' instructional quality and students' academic performance, in such that well-organised, easy-to-understand instructional materials and effective classroom management directly increase learners' learning performance. Teachers' professional competence and continued professional development are additional contributors to achieving student achievement. Meta-analytic evidence suggests that teaching self-efficacy, reflective practice and participation in professional development are strong predictors of student success (Lopez-Martinez et al., 2021). Behavioural and relational aspects of teaching are also important contributors to academic outcomes. Teachers' attendance at school, lesson preparation , and dedication to instructional responsibilities are positively related to students' achievement.

The above findings present compelling evidence that teacher-related factors, specifically, instructional practices, professional development, and the relationship between teachers and students, are foundational factors in determining academic performance. These results indicate that an emphasis on structural or demographic characteristics may be misplaced in efforts to improve student achievement, and that such efforts should focus on improving teaching quality, supporting teachers professional growth, and fostering positive classroom interactions. Therefore, it is necessary to examine teacher-related factors as a research hypothesis to understand how instruction practice, professional development, and teacher-student relations interact in order to affect academic performance. This type of investigation is especially essential in the context of a developing learning environment, as it provides evidence-based information that can be used to improve pedagogical processes, teacher education, and institutional decision-making to enhance student performance.

2.3 Flow Experience and Students' Performance in Blended English Learning Contexts

The flow experience has been gaining attention in educational research, particularly in blended learning contexts, as it can enhance student engagement and performance. In English as a Foreign Language (EFL) learning, the concept of flow has become a topic of growing interest as an affective-cognitive factor that affects learners' academic performance.

Empirical evidence indicates that flow experience has a positive, but insignificant, effect on the academic performance of university students enrolled in blended learning programs. Research in EFL settings has shown that positive flow, especially enjoyment, correlates with higher English performance, whereas negative flow experiences, including boredom and anxiety, correlate with lower academic performance (Wang and Huang, 2022). Furthermore, Wang and Huang (2022) found a strong positive relationship between enjoyment and English performance and a negative one between boredom and performance. Nevertheless, these comparatively small effect sizes indicate that flow can contribute to the variation in academic performance only to a small extent. Some studies suggest that the connection between flow and academic performance has little direct effect and instead focuses on indirect effects. It has been discovered that flow improves cognitive, emotional, and behavioural engagement and thus learning efficacy (Tang et al., 2023). On the same vein, Muller and Wulf (2022) revealed that flow mediates the connection between the characteristics of the blended learning environment flexibility and interaction with learning outcomes. These results are consistent with theoretical considerations that link flow to greater engagement and prolonged attention, which, in turn, promote learning rather than performance enhancement. Other significant moderating factors that determine the strength and nature of the flow-performance relationship are also established by research. It has also been shown that self-efficacy can mediate the positive correlation between learning engagement and academic performance, meaning that students with high levels of confidence in their skills can derive greater benefits from flow-enhanced engagement (Tang et al., 2022). On the other hand, the richness of the e-learning experience could offset the positive role of flow in learning outcomes, indicating that very active students do not use flow experiences to maintain their academic performance (Goh & Yang, 2021). Personal characteristics of learners also make the flow experience more diverse. It has been identified that differences in gender, academic major, proficiency in English, prior learning experiences, and attitudes towards the foreign language significantly affect levels of positive and negative flow (Wang, 2022). It is also worth noting that learners' attitude towards English has been a significant predictor of positive flow experiences, whereas academic major has been a significant predictor of negative flow experiences. One theme that appears throughout the literature is the importance of a challenge-skill balance in determining whether flow experiences are positive or negative. Tasks that are too easy cause boredom, and those that are too difficult cause anxiety, both of which are negatively correlated with academic performance (Wang and Huang, 2022). This highlights the relevance of adaptive instructional design in blended EFL settings, where task desirability must be meticulously adjusted to learners' skill levels to encourage desirable flow experiences. The reviewed literature demonstrates that academic performance in blended contexts of English language learning is affected by complex interactions among student-related factors, teacher practices, and learners' psychological engagement.

Although previous research has examined these dimensions individually, there has been very little on their interplay through the mediating role of flow experience. This gap points to the need for an integrative empirical study examining how student and teacher factors work in tandem to promote a flow experience and, in turn, lead to improved English learning outcomes in Chinese higher education. Accordingly, the current study is guided by the following research questions and hypotheses.

2.4 Underpinning Theory

The current research is based on the Flow Theory (Csikszentmihalyi, 1990), which explains an ideal state of mind achieved through total involvement, intense concentration, and a natural enjoyment of an activity. The theory states that flow arises when the level of skill exceeds the difficulty of the activity a person is engaged in, with specific objectives, instant feedback, and a sense of control over their actions. Such a state has been associated with increased motivation, improved cognitive processing, and higher performance on tasks in educational settings (Wang and Huang, 2022). Research in a Chinese blended EFL setting has also helped establish that flow is a continuum- enjoying it on one side of the spectrum, and being bored and anxious on the other- hence the need to not only consider the provision of flow in instructional design but also anti-flow factors. Among the 661 Chinese undergraduate EFL learners involved in the blended instruction, a similar number reported boredom and anxiety, as well as lower levels of enjoyment (Wang and Huang, 2022). The theoretical foundation chosen for this study, the Flow Theory, is relevant to the research purpose of examining how student- and teacher-related variables interact to achieve success in learning English in a blended classroom setting. Since the flow experience is the mediating construct through the various factors in the classroom that are expected to influence English learning outcomes, the concept of flow experience, as provided by the Flow Theory, offers the conceptual clarity and explanatory depth for conceptualising the why and how effects of this mediation. Empirical studies on blended and technology-supported English teaching in China have revealed that flow experience is a major factor affecting students' emotional, behavioural, and cognitive involvement (Tang et al., 2023), underscoring its applicability to the current situation. Based on this, the conceptual framework places student-related variables, such as language proficiency, self-regulation, and motivation, as predictors of learner skill, and teacher-related variables such as instruction design, scaffolding strategies, Timely feedback, and Classroom climate as the variables that make up the challenge dimension. The interplay of skill and challenge creates the flow experience, which acts as a mediating construct through which classroom conditions are translated to English learning success. This arrangement is supported by empirical studies: for instance, Li et al. (2025) identified that the relationship between basic psychological needs and engagement in the Chinese EFL digital learning environment goes through flow, and Tang et al. (2023) identified that flow is instrumental in creating cognitive, emotional, and behavioural engagement in a blended instruction setting. In practice, students who are more proficient in English, possess better self-regulation, and are more inclined to engage are more likely to experience a sense of flow when provided with properly designed blended tasks. In the meantime, educators who scaffold, provide timely, purposeful feedback, and set learners' tasks at their ability levels increase the likelihood that students will enter flow states. In the case of flow realisation, students are more engaged and motivated, more successful in overcoming the linguistic demands, and, in the end, more successful in gaining knowledge of the English language. Therefore, not only does Flow Theory bring together students' and teachers' factor spaces within a consistent theoretical framework, but it also provides a significant avenue for understanding how the process of blended instruction can result in higher English proficiency in the Chinese higher education environment.

Research Questions

1. What is the influence of student-related factors on English academic performance?

2. What is the influence of teacher-related factors on English academic performance?

3. What is the influence of flow experience on students' English academic performance?

4. Does flow experience mediate the relationship between student-related factors and English academic performance?

5. Does flow experience mediate the relationship between teacher-related factors and English academic performance?

Research Hypothesis

H1: Student-related factors have a significant positive effect on English academic performance.

H2: Teacher-related factors have a significant positive effect on English academic performance.

H3: Flow experience has a significant positive effect on English academic performance.

H4: Flow experience mediates the relationship between student-related factors and English academic performance.

H5: Flow experience mediates the relationship between teacher-related factors and English academic performance.

3. Research Methodology

This study investigated English learning performance in a blended learning setting, aiming to understand the effects of student- and teacher-related factors and flow experience on academic performance. The study employed a non-random purposive sampling technique, selecting first- and second-year undergraduate students with non-English majors who had direct experience with blended English learning. The choice of this non-probability sampling technique was appropriate because it is suitable to use in research that targets a particular group of learners, in this case, students who are enrolled in compulsory College English classes in English Medium Instruction (EMI) contexts, and relevant respondents can be recruited. The present research used the G* Power software to estimate the minimum sample size. By assuming a significance level of 0.05 and a statistical power of 0.80, and including three key predictor variables (student-related, teacher-related and flow experience), the analysis showed a minimum sample size of 77 participants. A sample of 250 questionnaires was distributed to deserving students during regular sessions. Out of the mailed questionnaires, 200 were returned, which consisted of 35 that were not counted because they were incomplete or had incongruent answers. The ultimate data set comprised 165 valid questionnaires

used in the statistical analyses and the study's future conclusions. With regard to demographic factors, the sample was balanced between male and female participants, although females were slightly more represented, which aligns with the overall enrolment trend in most non-science subjects at the undergraduate level. Most participants were aged 18-22, which is the typical age range for first- and Second-year university students.

Table 1. Profile of the respondent

Demographic	Categories	Total	%
Gender	Female	93	56.4
	Male	72	43.6
Age	17-18	68	41.2
	19-20	70	46.7
	Above20	20	12.1
Year of Study	First Year	77	46.7
	Second Year	88	56.3

Source: Author's own work

A structured survey questionnaire was used to collect the study data, comprising 38 items that represented the most important constructs of student-related factors, teacher-related factors, flow experience, and student academic performance in English. The questions in the questionnaires were all measured on a five-point Likert scale, with 1 indicating Strongly Disagree, 3 indicating Neutral, and 5 indicating Strongly Agree. The student-related measures were derived as adaptations of the Motivated Strategies Questionnaire (MSLQ) 9-item scale created by Pintrich et al. (1991) and additional engagement items grounded in the work of Fredricks et al. (2004). The factors related to teachers were based on the Student Evaluation of Educational Quality (SEEQ) 13-item scale by Marsh (1982) and the Teacher Support Scale by Patrick et al. (2007). Flow experience: 9 items were assessed with a modified version of the Flow Short Scale (Rheinberg et al., 2003) and task-related items of the EFL flow scale that was developed by Wang and Huang (2022). Lastly, the 7 items that represented English academic performance were adapted from the Academic Performance Scale by York, Gibson, and Rankin (2015).

In this study, PLS-SEM was used to analyse the data because it is the most appropriate tool for complex research models involving multiple latent constructs and mediating relationships (Hair et al., 2021). The analysis is especially suitable for the current study because it is more predictive and explanatory, less susceptible to breaches of multivariate normativity, and can be performed with relatively small sample sizes, such as the current sample of 165 respondents. The analysis was done in two stages. To determine the reliability and validity of the measurement model, the measurement loadings 0.70, the average variance extracted AVE 0.50, the internal consistency reliability in terms of Cronbachs alpha, and the composite reliability CR 0.70 were assessed, and the discriminant validity was determined using the Heterotrait-Monomethod (HTMT) ratio, which is more sensitive to detecting a problem of discriminant validity The structural model was then tested using path coefficient, statistical significance, and coefficient of determination (R2) to determine the explanatory power of the model used, and also tested the mediating effect of flow experience in the relationships between student-related factors, teacher-related factors, and English academic performance in blended learning settings.

4. Results

To meet the research goals, the study used SmartPLS version 4 (Ringle et al., 2022) to conduct PLS-SEM. This variance-based method was deemed appropriate because the model entailed several latent constructs and a mediation pathway and was not aimed at confirming the theory but at making predictions. PLS-SEM is widely used in educational and social science research when the model is complex and involves higher-order constructs. Before evaluating the measurement and structural models, the possible common method variance (CMV) was assessed by constructing a common latent factor and regressing all study variables on it (Kock and Lynn, 2012). To further assess the possibility of common method bias, Harman's single-factor test was conducted. An unrotated exploratory factor analysis (EFA) was conducted with all measurement items. The results showed that the first factor explained 22.80% of the total variance, a considerable amount below the recommended 50% (Podsakoff et al., 2003). Since this is not a serious concern in this study, it was not taken into consideration. See Table 2.

Table 2. Harman's Single-Factor Test Results

Component	Eigenvalue	(%) Variance Explained
1	12.085	22.803

In addition, the complete collinearity assessment was carried out according to Kock and Lynn (2012). The variance inflation factor (VIF) values for all variables ranged from 1.359 to 1.726, as presented in Table 3 below, which is below the conservative limit recommended by Kock (2015) of 3.3. As a result, common method bias was not a major concern for the validity of this study's results.

Table 3. Full Collinearity Assessment

CONSTRACT	ACADEMIC PERFORMANCE	FLOW EXPERIENCE	STUDENT FACTORS	TEACHER FACTORS
ACADEMIC PERFORMANCE				
FLOW EXPERIENCE	1.359			
STUDENT FACTORS		1.726		

TEACHER FACTORS	1.359	1.726

4.1 Measurement Model

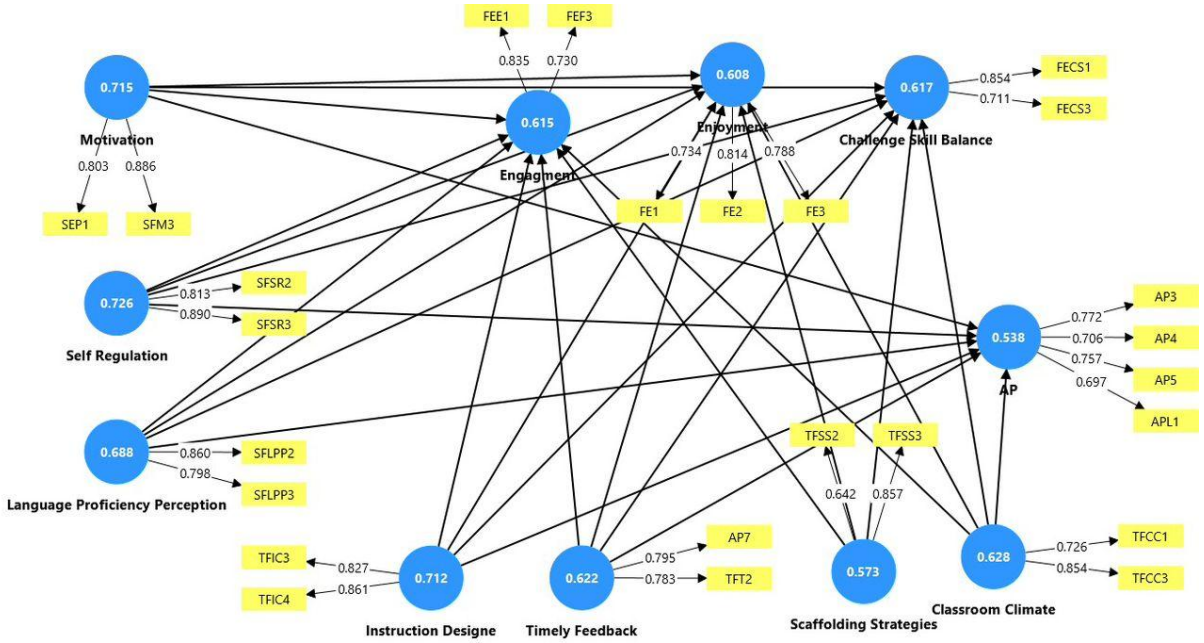

Figure 1. Measurement model

To determine convergent validity, the measurement model was tested using composite reliability (CR), Cronbach's alpha, factor loadings, and Average Variance Extracted (AVE) (Hair et al., 2021). Retained indicators in Figure 1 and Table 4 showed standardised factor loadings exceeding 0.70, thereby meeting the recommended threshold. The composite reliability of all constructs ranged from 0.725 to 0.841, exceeding the acceptable threshold of 0.70 and indicating high internal consistency. All AVE values for the latent variables were above 0.50, indicating that each construct accounted for more than half of the variance in its indicators and thus demonstrating satisfactory convergent validity. Student factors, teacher factors, flow experience and students' academic performance all fulfilled this requirement. To assess discriminant validity, the Heterotrait-Monotrait ratio (HTMT) was analysed according to Henseler et al. (2015). The HTMT values in Table 5 were below the conservative threshold of 0.90, indicating that the constructs were empirically distinct. Along with that, the Fornell-Larcker criterion also endorsed discriminant validity since the square root of AVE of each construct surpassed its correlations with other constructs.

Table 4. Loadings, Weights, Average Variance Extracted (AVE) and Composite Reliability (CR)

1st Order	**2nd Order**	**Cronbach's Alpha**	**Composite Reliability (Cr)**	**Average Variance Extracted (AVE)**
Motivation	Students Factors	0.706	0.834	0.715
Self-Regulation		0.728	0.841	0.726
Language Proficiency Perception		0.750	0.815	0.688
Instruction Designe	Teachers Factors	0.827	0.832	0.712
Timely Feedback		0.795	0.767	0.622
Scaffolding Strategies		0.868	0.725	0.573
Classroom Climate		0.805	0.770	0.628
Enjoyment	Flow Experience	0.876	0.823	0.608
Engagement		0.872	0.761	0.615
Challenge Skill Balance		0.788	0.769	0.617
Academic Performance	Academic Performance	0.724	0.823	0.538

Table 5. Discriminant Validity (HTMT)

CONSTRUCT	AP	CSB	CC	E1	E2	ID	LPP	M	SS	SR	TF
Academic Performance (AP)											
Challenge Skill Balance (CSB)	0.560										
Classroom Climate	0.342	0.793									

(CC)										
Engagement (E1)	0.385	**0.950**	0.598							
Enjoyment(E2)	0.867	0.741	0.348	0.416						
Instruction Design	0.244	0.731	0.648	0.727	0.340					
Language Proficiency Perception (LPP)	0.350	0.711	0.631	0.537	0.446	0.802				
Motivation (M)	0.275	0.581	0.699	0.607	0.403	0.729	0.828			
Scaffolding Strategies (SS)	0.387	0.636	.367	0.531	0.542	0.781	0.766	0.859		
Self Regulation (SR)	0.326	0.684	0.563	0.359	0.356	0.802	0.691	0.863	0.894	
Timely Feedback (TF)	0.729	0.722	0.644	0.812	0.787	0.796	0.780	0.457	0.761	0.642

The HTMT value for the Engagement and Challenge-Skill Balance exceeded the conservative threshold of 0.90, but additional testing was performed using the HTMT value inference procedure recommended by Henseler et al. (2015) and Hair et al. (2021). The HTMT statistic bootstrapped confidence interval in Table 6 did not contain 1.0, suggesting that there was still discriminant validity between the two constructs. The finding in the present study indicates that Engagement and Challenge-Skill Balance are conceptually close rather than a lack of discriminant validity, as they are theoretically related. Hence, both dimensions were kept for the measurement model.

Table 6. HTMT Inference Analysis

HTMT Ratio	**Confidence Interval**	
	Lower Limit	**Upper Limit**
SLP and SLE	0.856	0.958

The bootstrapped confidence interval did not include 1.0, indicating that discriminant validity was confirmed for Engagement and Challenge-Skill Balance, despite relatively high HTMT value. Hence, the two dimensions were included in the measurement model.

Structural Model Assessment

The structural model results shown in Figure 2 provide excellent empirical confirmation of the hypotheses regarding the relationships among student-related variables, teacher-related variables, flow experience and English academic performance.

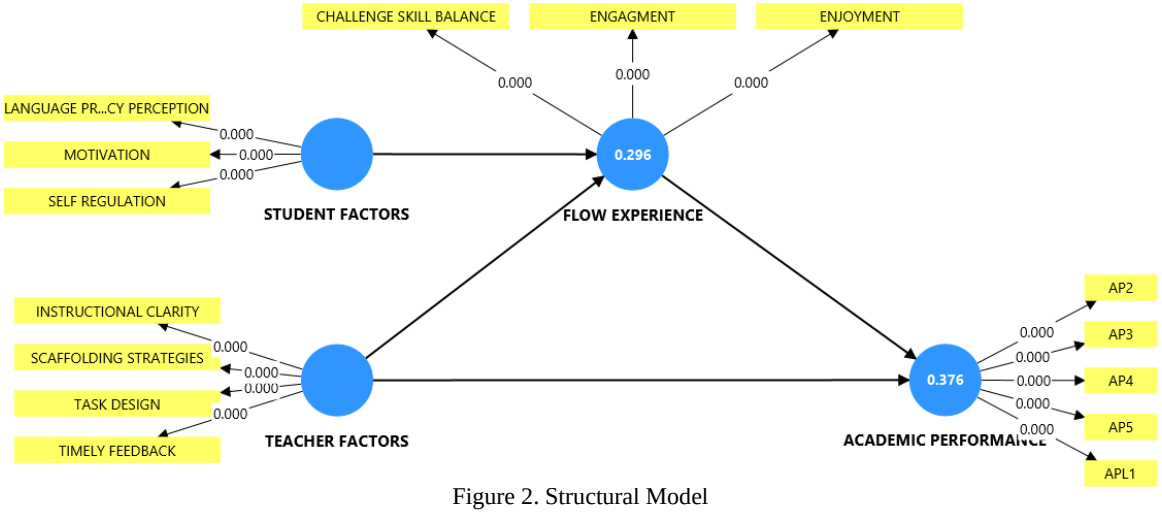

Figure 2. Structural Model

Table 7. Results of the Structural Model Analysis (Hypotheses Testing)

Hypothesis	Relationship	Std. Beta	Std. Dev	*T-value*	P-value
H1	SF→AP	0.151	0.048	3.148	< 0.001
H2	TF→AP	0.234	0.054	4.353	< 0.001
H3	FE→AP	0.645	0.061	10.630	< 0.001
H4	SF→FE→AP	0.233	0.071	3.286	< 0.001
H5	TF→FE→AP	0.363	0.075	4.854	< 0.001

Notes. SF=Student Factors, TF=Teacher Factors, FE=Flow Experience, AP=Academic Performance

Table 7 indicates that H1: There is a positive influence of student-related factors on English academic performance. This is concluded because the direct path coefficient of Student Factors and Academic Performance is positive and statistically significant (b = 0.151, t = 3.148, p = 0.001). As the p-value is less than the standard value of 0.05, it indicates that the relationship is not due to random chance but rather a matter of fact and a valid influence of student-related factors on their English academic performance. Theoretically, the result implies that the main student-related factors, including perceptions of language proficiency, motivation, and self-regulation, play a significant role in determining students' academic performance. Even though the effect's value is moderate compared to other effects in the

model, it is educationally important because it shows that academic performance does not depend mainly on the quality of teaching or the design of instruction, but is also strongly influenced by learners' internal cognitive and motivational variables. Thus, H1 is accepted, indicating that the factors that positively and significantly affect students' English academic performance. Additionally, H2 is confirmed, indicating that teacher-related influences have a strong, direct, positive impact on English academic performance ($b = 0.234$, $t = 4.353$, $p < 0.001$). The fact that the coefficient is stronger than the student factors suggests that clarity of instruction, use of scaffolds, task design , and prompt feedback have a significant influence on student achievement. This underscores the importance of pedagogical quality and instructional design in English-medium settings, where teaching practices can significantly contribute to learners' overall academic achievement, not just individual students'. As regards flow experience. H3 is clearly supported, as the flow experience shows a significant, very strong positive impact on academic performance ($b = 0.645$, $t = 10.630$, $p = 0.001$). This suggests that the greater the levels of engagement, enjoyment, and balance between challenge and skill, the better students' academic results in English, and that flow is a strong psychological state that enables successful learning. Lastly, the mediation hypotheses (H4 and H5) also receive the support of the importance of the indirect effects. The mediatory role of the flow experience in relation to student factors on academic performance is also significant ($b = 0.233$, $t = 3.286$, $p = 0.000$), indicating that the portion of the effect of student individualities on achievement passes through improvements in students' flow experience. In the same way, the indirect influence of teacher-related aspects through flow experience is strong and substantial ($b = 0.363$, $t = 4.854$, $p < 0.001$), indicating that the quality of teaching practices enhances academic performance by partially increasing flow among learners. All of these results indicate a partial mediation model in which student and teacher variables both have direct effects on performance and, through flow experience, an indirect effect, showing the integrative nature of psychological engagement in determining how instructional and learner variables translate into academic success.

5. Discussion

The current study aimed to examine direct and mediated relationships among student and teacher factors, flow experience, and English academic performance in a Chinese blended classroom context. The results provide significant empirical support for the proposed framework grounded in Flow Theory (Csikszentmihalyi, 1990) and contribute to the current body of research on blended learning in higher education. The findings demonstrate that academic performance in English is influenced by interactions among student- and teacher-related factors and flow experience; hence, they uphold an integrative rather than a fragmented understanding of learning outcomes. To begin with, the strong positive impact of student-related variables on English academic performance supports a robust body of literature that underscores the primacy of internal learner factors. The existing result aligns with the literature, which illustrates that motivation is a core psychological process that maintains effort and goal-directed action (Le Thai Hung et al., 2025). The effect is also consistent with the literature on the value of self-regulation, the persistence of learning, and the role of study tactics in the development of academic trajectories (Lopez, 2025). Self-regulatory capacity is especially acute in blended English environments where learners are left to navigate the digital environment and cope with cognitive load. The current results, therefore, substantiate that language proficiency perception, motivation orientation, and regulatory control are all potentially the skill constituents in the challenge-skill ratio at the core of the Flow Theory. Furthermore, given that digital distraction and problematic technology use are associated with poor academic performance (Hsieh, 2025), the beneficial role of self-regulation in digital-mediated learning contexts is highlighted by the positive impact of the factor in this study. Second, the greater direct impact of teacher-specific variables on academic achievement confirms a wealth of empirical evidence on the role of teacher quality in shaping student achievement. In line with Wenglinsky (2002) and Lopez-Martin et al. (2021), the results indicate that pedagogical practices can account for a significant portion of the variance in achievement. Instructional clarity, scaffolding, appropriate calibration task design, and timely feedback, which are considered in the present research, are structural mechanisms for regulating the dimension of challenge in the Flow Theory. When instructional requirements are properly matched to learners' competence, cognitive overload and disengagement are reduced. This meaning is consistent with the evidence that effective teaching practices and favourable classroom conditions have a great positive impact on academic performance (Fehintola et al., 2014). The current findings thus support the thesis that teachers' practice is not a non-core contextual variable but a fundamental determinant of academic success, especially in blended English-mediated environments where organised guidance remains necessary even when technology is integrated. However, the finding that the direct effects of teacher-related factors were stronger than those of student-related factors might reflect the nature of the Chinese education system. In China, higher education has long been heavily focused on the role of the teacher, the structure of the instruction and the authority of the teacher. This means that students can become dependent on teachers for learning support, feedback and classroom organisation. It is thus important in a blended EFL environment to pay attention to instructional design and scaffolding as their impact on academic achievement could be significant. Third, the remarkably high impact of flow experience on academic performance is among the most theoretically relevant results of this research. Although prior studies have found small or indirect effects of flow on performance (Wang and Huang, 2022), the current results indicate a significant direct effect. This implies that within the studied blended EFL learning setting, the high degree of psychological immersion, which includes engagement, enjoyment, and the optimal match of challenges and skills, will be directly related to better academic performance. This finding supports Tang et al. (2022), who claimed that flow increases cognitive and emotional engagement, but their findings go further by demonstrating that flow not only increases engagement but also has a quantifiable impact on performance. The high value of this coefficient could indicate that, under conditions of good fit between instructional and learner conditions, flow not only emerges as an affective state but also as a performance-enhancing cognitive process that helps maintain attention, efficient information processing, and language proficiency. The results of mediation also provide support to the explanatory ability of Flow Theory in this situation. The partial mediation model is supported by the strong indirect effects of student- and teacher-related factors through the flow experience. The results are theoretically consistent with other research in the field, which shows that

flow mediates the association between environmental factors and learning and developmental outcomes (Mueller and Wulf, 2022; Li et al., 2025). A possible reason for the significantly greater impact of flow is that flow is a current state of intellect in which learning activities are perceived. Student-related and teacher-related factors act as antecedent conditions, and flow is the direct involvement of the learner in the learning process. Thus, flow might be a more immediate determinant of academic outcomes than other student or teaching attributes. Notably, the present research contributes to the literature by incorporating both a learner and an instructional variable within a single structural framework. Unlike earlier studies, which commonly examined these dimensions independently, the current results show that student dispositions and teacher practices have both direct and indirect effects on performance by supporting optimal psychological engagement. The outcome of mediation also empirically validates a challenge-skill ratio hypothesis that is the main concept of the Flow Theory. Variables involving the students help shape perceived competence as a skill; the teacher ones organise the learning requirements, such as challenge. Proper synchronisation of these dimensions results in the development of flow, which transforms classroom conditions into academic performance. On the other hand, previous studies have demonstrated that imbalance, due to either too simple or too challenging tasks, causes boredom or anxiety, both of which are negatively related to performance (Wang and Huang, 2022). The current results thus confirm the significance of adaptive instructional design in blended EFL settings. Collectively, the discussion highlights that the issue of English academic performance across blended higher education settings cannot be attributed to any single psychological or instructional factor. Rather, it is a product of a complex system in which learners' capabilities, pedagogical design and psychological involvement interact dynamically. The findings not only demonstrate that Flow Theory is a strong explanatory framework but also fill an important gap in the literature by empirically showing both direct and mediated interrelations among student factors, teacher factors, and academic performance. In practice, the findings imply that, to enhance English performance in the blended learning setting, a two-pronged approach should be adopted to strengthen students' motivation and self-regulation and, at the same time, increase the clarity of instruction, the use of scaffolding techniques, and feedback systems. More to the point, the instructional design should be specifically intended to foster flow by meticulously adjusting task difficulty to learners' levels of competence. This way, institutions will cease to engage to scattered interventions and adopt an integrative approach that unites psychological engagement and pedagogical excellence to achieve long-term academic achievement in English language learning.

6. Conclusion

This research examined the correlations among student-related factors, teacher-related factors, flow experience, and academic performance in English in a Chinese blended classroom setting. Using the Flow Theory, the study aimed to describe how the combination of learner and instructional factors contributes to the success of English learning through the mediating role of psychological engagement. The proposed model was empirically supported using PLS-SEM. The results show that student-related and teacher-related factors have significant positive impacts on English academic performance. Learner-related variables, such as perceived language proficiency, motivation, and self-regulation, have a direct impact on academic outcomes, whereas teacher-related variables, such as instructional design, scaffolding, the timeliness of feedback, and the classroom climate, have an even greater impact. These findings affirm that effective English acquisition in blended environments is influenced by the interaction between learners' abilities and the quality of instruction. Flow experience came out as a key process in this process. These findings reveal that flow experience has a direct positive impact on academic performance and mediates the overall relationships between student-related and teacher-related, academic performance. The given result provides empirical evidence for the challenge-skill balance concept of the Flow Theory, meaning that the optimal match between learners' skills and the teaching requirements contributes to pronounced engagement, pleasure, and better academic performance. In conclusion, this study has an impact on the blended literature in EFL by combining the variables of students and teachers into a single explanatory framework through the flow experience. The results reveal the need to develop blended English classrooms that do not rely solely on technology but also deliberately foster psychological involvement through adaptive teaching and learner support, thereby improving English academic achievement at higher levels of education.

7. Limitations

Even though this study has contributed to the field of theory and empirically, some limitations are worth considering. To start with, the purposive sampling method is not a random technique, which restricts the applicability of the results. The sample comprised 165 undergraduates in the first and second years who are not majoring in English but are in a particular Chinese higher education scenario. Although this sampling method was suitable for studying the students with firsthand experience in blended learning in English, the findings might not be fully applicable to other academic departments, colleges, and cultural backgrounds. Further studies using larger samples and varied study populations across different universities would improve external validity. Also, the research relied on self-reported data from questionnaires, which is likely to lead to common method bias and social desirability bias. Despite the use of statistical procedures to identify common method variance, the perceptual measures used might not be sufficient to reflect the true behavioural engagement and objective academic performance.

Academic performance was assessed based on students' self-reports rather than institutional records. GPA, standardised English test scores or official academic records should be included in future studies. The inclusion of several sources of data, including standardised tests of English in their use, or classroom observations or learning analytics, would enhance the quality of further research. Moreover, an alternative explanation should be considered. The cross-sectional design in this study does not allow for determining the direction of the relationship. Higher academic performance may also lead to higher flow experience among students. Further longitudinal analyses are warranted to better understand the direction of these relationships. Besides, other variables that could have been included in the model, such as self-efficacy,

digital literacy, or socioeconomic background, were not used and could be added to the explanatory system.

8. Implications

The findings have significant theoretical, pedagogical and policy implications. In theory, the paper applies the Flow Theory, empirically substantiates the challenge-skill balance mechanism in a blended EFL context and incorporates student- and teacher-related variables into a single structural equation. This adds to the more holistic picture of the mediation of the relationship between instigating conditions and learning outcomes through the involvement of psychology. Pedagogically, the results emphasise the need for adaptive instructional design in blended English classrooms. Teachers need to set tasks appropriately, in line with their students' skills, to achieve the optimal level of challenge-skill and create flow. Structured scaffolding, timely feedback, and supportive classroom climates are essential in sustaining engagement and reducing boredom or anxiety. At the same time, interventions to enhance students' motivational orientations and self-regulatory abilities should be conducted through the institution, especially in digitally mediated learning settings where autonomous learning plays a significant role. Policy-wise, professional development plans must equip instructors with the competencies to structure the learning environment in a way that promotes the flow of knowledge and to utilise technology in a way that engages them. The institutional approaches must go beyond technological uptake and aim to establish psychological engagement as a focal point of academic achievement in English-based higher education.

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Author contributions

Dr. Shorouk Conceptualization, Data curation, Formal analysis, Methodology, Writing –original draft, Writing – review & editing, Funding acquisition. Liu Jing: Formal analysis, Writing – original draft, Writing review & editing. Dr. Esayas: Software, Writing – original draft, Writing – review & editing. Dr. Meshari: Validation, Writing – review & editing.

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The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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No additional data are available.

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