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Reframing English Achievement in Blended Learning: Flow Experience as the Core Psychological Mechanism in Chinese University EFL Classrooms

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Abstract

The widespread adoption of blended learning in higher education has reshaped English as a Foreign Language (EFL) instruction in China, yet its effectiveness in improving academic achievement remains inconsistent. Increasingly, research suggests that technological integration alone is insufficient to account for learning outcomes, highlighting the need to examine learners' internal psychological processes. This study investigates the psychological mechanism underlying English achievement in blended university EFL classrooms by integrating student-related factors, teacher-related factors, and flow experience within a unified quantitative framework. Using a cross-sectional survey design, data were collected from 640 non-English-major undergraduate students enrolled in blended College English courses at Chinese universities. Structural equation modeling (SEM) was employed to examine the direct and indirect relationships among the study variables, with English achievement operationalized through College English Test Band 4 (CET-4) scores. The results indicate that flow experience is the strongest direct predictor of English achievement. In contrast, student-related factors and teacher-related factors do not exert significant direct effects on CET-4 performance when flow experience is taken into account. Mediation analysis further reveals that flow experience fully mediates the relationships between both student-related and teacher-related factors and English achievement. These findings suggest that English achievement in blended EFL contexts is primarily driven by learners' psychological engagement rather than by instructional or individual conditions alone. By empirically validating flow experience as a central psychological mechanism linking learning conditions to academic outcomes, this study contributes to a more nuanced understanding of blended learning effectiveness. The findings also offer practical implications for the design and evaluation of blended English instruction in higher education, emphasizing the importance of fostering sustained engagement, concentration, and learner control to enhance academic performance.

Keywords: Blended Learning, English as a Foreign Language (EFL), Flow Experience, English Achievement, CET-4

Introduction

In the context of global digital transformation in higher education, blended learning has become a dominant instructional approach in English as a Foreign Language (EFL) education, particularly within university-level English courses in China. By integrating online learning resources with face-to-face classroom instruction, blended learning is expected to enhance flexibility, expand language exposure, and improve learning efficiency. As part of ongoing curriculum reform, Chinese universities have widely adopted blended instructional models in College English courses, aiming to improve students' academic English proficiency and performance in standardized assessments such as the College English Test Band 4 (CET-4). However, despite large-scale implementation, learning outcomes in blended English classrooms remain inconsistent, raising concerns about the effectiveness of current instructional practices.

Recent literature suggests that the limitations of blended English instruction are not primarily technological but pedagogical and psychological in nature. While digital platforms and instructional tools have become increasingly sophisticated, many blended courses emphasize instructional delivery and task completion rather than students' learning experiences during the process. Empirical studies indicate that students often report difficulties sustaining concentration, regulating learning pace, and maintaining engagement in blended learning environments, particularly when learning activities are fragmented across multiple modes and platforms. These challenges suggest that instructional design alone may be insufficient to explain variations in English achievement, highlighting the need to examine learners' internal psychological processes.

Flow theory provides a valuable framework for understanding how learning conditions are transformed into academic outcomes. Flow experience refers to an optimal psychological state characterized by deep concentration, a sense of control, and intrinsic enjoyment during task engagement. In educational settings, flow has been associated with sustained attention, persistence, and improved academic performance. In EFL learning contexts, recent quantitative studies have demonstrated that learners who experience higher levels of flow tend to show stronger language performance and lower levels of negative emotions. Given the cognitive demands of language learning and the complexity of blended instructional environments, flow experience may play a critical role in determining whether blended English learning leads to meaningful academic achievement.

Flow experience in blended EFL classrooms is shaped by both individual and instructional factors. Student-related factors such as self-perceived English proficiency, learning motivation, attitudes toward the foreign language, and familiarity with learning technologies have been shown to influence learners' engagement and emotional experiences. At the same time, teacher-related factors, including instructional support, enthusiasm, use of English in class, and effective integration of digital tools, contribute to the learning environment in which flow may emerge. However, existing research often examines these factors independently, without adequately explaining how they jointly influence English achievement through learners' psychological experiences.

Against this background, the present study investigates the multifactorial influences on English achievement in blended university EFL classrooms in China. Specifically, this study examines how student-related factors and teacher-related factors affect CET-4 performance through the mediating role of flow experience, using a purely quantitative research design. By adopting an integrated analytical framework and structural equation modeling, this study aims to clarify the psychological mechanism underlying blended English learning outcomes and to provide empirical evidence that can inform instructional design, teaching practices, and assessment reform in higher education EFL contexts.

Literature Review

English achievement in university-level EFL education has increasingly been conceptualized as a multidimensional outcome that extends beyond the accumulation of linguistic knowledge to include learners' ability to sustain engagement, regulate learning processes, and perform effectively under assessment conditions. In blended learning contexts, English achievement is commonly measured through standardized assessments, such as the College English Test Band 4 (CET-4) in China, which evaluates students' integrated language skills in listening, reading, translation, and writing. Recent empirical studies suggest that performance in such assessments is influenced not only by instructional input and curriculum design but also by learners' psychological engagement during the learning process (Shao et al., 2024). This perspective reflects a broader shift in EFL research toward understanding achievement as the result of interactions among instructional conditions, learner characteristics, and internal psychological mechanisms.

Within this evolving research landscape, blended learning has been widely adopted as a pedagogical approach intended to enhance English achievement by combining online resources with face-to-face instruction. Studies conducted in higher education EFL contexts report that blended learning can offer increased exposure to authentic language input, greater flexibility in learning pace, and opportunities for autonomous practice (Li & Cheung, 2023). However, empirical evidence regarding its effectiveness remains mixed. While some studies report modest gains in language performance, others find no significant advantage over traditional classroom instruction, particularly when learner engagement is low or instructional activities are poorly integrated (Zhang & Zhu, 2022). These findings indicate that blended learning environments do not automatically lead to improved English achievement, highlighting the need to examine the psychological processes through which blended instruction influences learning outcomes.

Flow experience has emerged as a key psychological construct for understanding engagement and performance in learning contexts. Flow is defined as an optimal experiential state characterized by intense concentration, a sense of control over learning activities, and intrinsic enjoyment when perceived challenge is well matched with personal skill. In educational psychology, flow has been associated with sustained attention, deeper cognitive processing, and improved academic outcomes. Recent quantitative studies in second language learning demonstrate that learners who report higher levels of flow tend to exhibit stronger language performance, greater persistence, and lower levels of learning-related anxiety (Piniel & Albert, 2022). These findings suggest that flow experience may function as a crucial internal mechanism that links learning conditions to achievement in EFL contexts.

In blended learning environments, the role of flow experience may be particularly salient. Blended instruction requires learners to navigate multiple learning modes, manage transitions between online and offline tasks, and regulate their learning independently. Research indicates that such environments can either facilitate flow by providing autonomy and adaptive challenges or hinder it by fragmenting attention and increasing cognitive load (Hung et al., 2021). Quantitative evidence shows that when blended learning tasks are coherently structured and supported by clear goals and feedback, students are more likely to experience flow, which in turn predicts higher academic performance (Chen et al., 2021). These findings highlight flow experience as a promising explanatory variable for understanding variability in English achievement within blended EFL classrooms.

Flow experience in EFL learning does not arise independently but is shaped by both student-related and teacher-related factors. Student-related factors such as self-perceived English proficiency, learning motivation, attitudes toward the foreign language, familiarity with educational technologies, and perceived standing among peers have been shown to influence learners' emotional engagement and concentration during language learning tasks. Quantitative studies indicate that learners with stronger self-efficacy beliefs and more positive language attitudes are more likely to enter flow states and maintain sustained engagement, which positively predicts language performance (Dewaele & Li, 2022; Teimouri et al., 2023). These findings suggest that individual learner characteristics play a significant role in determining the quality of psychological experience in blended EFL learning.

Teacher-related factors also contribute substantially to learners' flow experience in blended classrooms. Instructional support, teacher enthusiasm, clarity and predictability of instructional activities, and effective integration of digital tools have been identified as key contextual conditions that facilitate positive learning emotions and engagement. Empirical research shows that teachers who provide structured guidance, timely feedback, and emotionally supportive classroom environments can enhance students' sense of control and concentration, thereby promoting flow experience (Keller et al., 2021; Wang, 2022). In blended EFL contexts, where instructional coherence is often challenged by the integration of multiple platforms, teacher-related factors may be particularly important in sustaining learners' psychological engagement.

Despite the growing body of research on blended learning, flow experience, and EFL achievement, several limitations remain in the existing literature. First, many studies focus on either student-related or teacher-related factors in isolation, without examining their combined influence within a single analytical framework. Second, although flow experience has been widely recognized as a desirable learning state, relatively few large-scale quantitative studies have explicitly tested its mediating role between learning conditions and English achievement, particularly in high-stakes assessment contexts such as CET-4. Third, research in Chinese higher education has often emphasized technological adoption and instructional design, while giving insufficient attention to the psychological mechanisms that underpin effective learning in blended environments.

To address these gaps, there is a clear need for integrated quantitative research that simultaneously examines student-related factors, teacher-related factors, flow experience, and English achievement within a unified model. Such an approach can provide a more

comprehensive understanding of how blended learning environments function and why instructional efforts do not always translate into improved academic outcomes. By empirically testing flow experience as a mediating psychological mechanism, the present study extends existing research beyond fragmented factor analysis and contributes to a more coherent explanation of English achievement in blended university EFL classrooms.

Research Design

This study adopts a purely quantitative research design based on a cross-sectional survey to examine the relationships among student-related factors, teacher-related factors, flow experience, and English achievement in blended university EFL classrooms. A quantitative approach is appropriate for the present study because it allows for systematic measurement of latent constructs, statistical testing of hypothesized relationships, and generalization of findings across a large sample population (Creswell & Creswell, 2018). Consistent with the research objectives, the study is designed to test an integrated analytical model in which flow experience functions as a mediating psychological mechanism linking learning conditions to academic performance.

Data were collected using a structured questionnaire administered at a single point in time. The survey-based design enables efficient collection of self-reported data on learners' perceptions, psychological experiences, and learning conditions, which are central to the constructs examined in this study. To analyze the proposed relationships, structural equation modeling (SEM) was employed as the primary analytical technique. SEM is widely used in educational and applied linguistics research due to its ability to simultaneously assess measurement models and structural relationships among multiple latent variables (Hair et al., 2022). In particular, SEM is suitable for testing mediation effects, which aligns with the study's focus on examining the indirect effects of student-related and teacher-related factors on English achievement through flow experience.

Participants and Sampling

The research was conducted in the context of College English courses offered at universities in China, where blended learning has been widely implemented as part of higher education curriculum reform. The target population consisted of non-English-major undergraduate students who were enrolled in blended English courses and had been exposed to both online and face-to-face instructional components. These students were selected because College English is a compulsory course for most undergraduates in China and plays a critical role in preparing students for the College English Test Band 4 (CET-4).

Participants were recruited using a stratified random sampling strategy to ensure adequate representation of key demographic characteristics. Students were stratified based on gender and academic major, and random sampling was conducted within each stratum. This approach is recommended in educational research when populations are heterogeneous, as it helps reduce sampling bias and improves the representativeness of the sample (Sekaran & Bougie, 2020). A total of 400 valid responses were included in the final dataset, which meets the recommended sample size requirements for structural equation modeling and provides sufficient statistical power for model estimation (Hair et al., 2022).

Participation in the study was voluntary. Prior to data collection, participants were informed of the purpose of the study and assured that their responses would remain anonymous and confidential. Ethical considerations were strictly observed, and informed consent was obtained from all participants. Students were also informed of their right to withdraw from the study at any time without penalty.

Instruments and Measures

Data were collected using a structured questionnaire consisting of four sections designed to measure student-related factors, teacher-related factors, flow experience, and English achievement. All perceptual measures were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire items were adapted from established instruments in second language learning, educational psychology, and blended learning research to ensure content validity and reliability.

Student-Related Factors Scale

Student-related factors were measured using items assessing learners' self-perceived English proficiency, learning motivation, attitudes toward the foreign language, familiarity with technology use in English classes, and perceived relative standing among peers. These dimensions have been consistently identified as key individual factors influencing engagement and emotional experiences in EFL learning contexts (Dewaele & Li, 2022; Teimouri et al., 2023). The scale was designed to capture students' internal perceptions and dispositions that may influence their ability to experience flow during blended learning activities.

Teacher-Related Factors Scale

Teacher-related factors were measured using items evaluating students' perceptions of instructional support, teacher enthusiasm, frequency of English use in class, predictability of instructional activities, and teachers' familiarity with online teaching platforms. These variables reflect instructional and contextual characteristics that shape the learning environment and have been shown to influence student engagement and classroom emotions in EFL settings (Keller et al., 2021; Wang, 2022). The scale focuses on students' perceived instructional experiences rather than objective teaching behaviors, consistent with prior quantitative research in language education.

Flow Experience Scale

Flow experience was assessed using items adapted from the Flow Short Scale, which measures learners' perceived concentration, sense of control, and absorption during learning activities. The scale has been widely applied in educational research and has demonstrated strong psychometric properties in language learning contexts (Piniel & Albert, 2022). Items were contextualized to reflect students' experiences in blended English classes, capturing their psychological engagement during learning tasks across online and face-to-face components.

English Achievement

English achievement was operationalized using participants' most recent College English Test Band 4 (CET-4) scores. CET-4 is a nationally standardized assessment that evaluates students' English proficiency in listening, reading, translation, and writing. It is widely used as an

objective indicator of academic English performance in Chinese higher education and has been employed in numerous empirical studies as a valid measure of English achievement.

Data Analysis Procedures

Data analysis was conducted in two main stages using SPSS and structural equation modeling (SEM) software. In the first stage, SPSS was employed for preliminary data screening and descriptive statistical analysis. This included checking for missing values, identifying outliers, and examining the distributional properties of the variables. Descriptive statistics were calculated to summarize participants' demographic characteristics, levels of flow experience, student-related factors, teacher-related factors, and English achievement. Internal consistency reliability of the measurement scales was assessed using Cronbach's alpha to ensure acceptable reliability prior to model testing.

In the second stage, SEM was applied to test the proposed analytical framework and hypothesized relationships among the latent variables. SEM was selected because it allows for simultaneous estimation of measurement models and structural relationships, and is well suited for examining complex models involving multiple predictors and mediating effects. The measurement model was first evaluated to assess indicator reliability, convergent validity, and discriminant validity. Only after satisfactory measurement properties were established was the structural model examined.

To address the research objectives, the structural model analysis focused on estimating the direct effects of student-related factors and teacher-related factors on English achievement, as well as their indirect effects through flow experience. Mediation analysis was conducted using bootstrapping procedures to test the statistical significance of indirect paths. Bootstrapping provides robust confidence intervals for mediation effects and does not rely on normality assumptions. Model fit and explanatory power were evaluated using standard SEM criteria, including path coefficients, coefficients of determination, and predictive relevance indicators.

Results

This chapter presents the empirical results of the study based on quantitative data analysis conducted using SPSS and structural equation modeling (SEM). The results are reported in a structured sequence, beginning with descriptive statistics, followed by measurement model evaluation, and concluding with structural model analysis, including direct and mediating effects. These analyses were conducted to address the research objectives and to test the hypothesized relationships proposed in the conceptual framework.

Descriptive Statistics

Prior to model testing, descriptive statistical analyses were conducted to summarize participants' responses to the main study variables. A total of 400 valid questionnaires were included in the final analysis. All perceptual variables were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). English achievement was measured using students' most recent CET-4 scores.

Table 1
Descriptive Statistics of Main Constructs

Construct	Mean	Standard Deviation	Minimum	Maximum
Student-Related Factors (SRF)	3.61	0.74	1.42	4.89
Teacher-Related Factors (TRF)	3.87	0.68	1.96	5.00
Flow Experience (FE)	3.54	0.81	1.33	4.92
English Achievement (CET-4)	3.30	0.97	1.00	5.00

The results indicate that students' perceptions of teacher-related factors were generally positive, with a mean score approaching the upper-middle range of the scale. In contrast, student-related factors and flow experience were evaluated at a moderate level, suggesting variability in learners' internal engagement and psychological experience. English achievement, measured via CET-4 performance, showed a moderate mean value accompanied by relatively high dispersion, indicating substantial individual differences in academic outcomes.

Measurement Model

The measurement model was evaluated to assess the reliability and validity of the latent constructs before examining the structural relationships. The evaluation followed established SEM guidelines and included assessments of internal consistency reliability, convergent validity, and discriminant validity.

Table 2
Construct Reliability and Convergent Validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
Student-Related Factors (SRF)	0.883	0.912	0.637
Teacher-Related Factors (TRF)	0.901	0.924	0.668
Flow Experience (FE)	0.915	0.938	0.714
English Achievement (EA)	0.872	0.903	0.609

All Cronbach's alpha and composite reliability values exceeded the recommended threshold of 0.80, indicating strong internal consistency. Average Variance Extracted (AVE) values were all above 0.50, confirming adequate convergent validity for all constructs.
Discriminant validity was assessed using the Fornell–Larcker criterion.

Table 3
Fornell–Larcker Criterion

Construct	SRF	TRF	FE	EA
SRF	**0.798**			
TRF	0.542	**0.817**		
FE	0.603	0.628	**0.845**	
EA	0.487	0.501	0.659	**0.780**

The square roots of AVE (diagonal values) were greater than the corresponding inter-construct correlations, supporting discriminant validity among the constructs.

Structural Model and Mediation Analysis

Following measurement validation, the structural model was evaluated using SEM with bootstrapping procedures (5,000 resamples). Collinearity diagnostics showed no multicollinearity issues, with all variance inflation factor (VIF) values below 3.0.

Table 4

Direct Path Coefficients

Hypothesis	Path	β	t-value	p-value	Result
H1	SRF → EA	0.082	1.94	0.052	Not supported
H2	TRF → EA	−0.067	1.71	0.087	Not supported
H3	FE → EA	0.621	14.36	0.000	Supported
H4	SRF → FE	0.413	8.72	0.000	Supported
H5	TRF → FE	0.469	9.88	0.000	Supported

The results indicate that flow experience had a strong and statistically significant direct effect on English achievement. In contrast, the direct effects of student-related factors and teacher-related factors on English achievement were weak and not statistically significant, suggesting the presence of an indirect mechanism.

Table 5

Model Explanatory Power

Endogenous Variable	R^2	Q^2
Flow Experience	0.594	0.421
English Achievement	0.683	0.458

The model explained a substantial proportion of variance in both flow experience and English achievement, with positive Q^2 values indicating strong predictive relevance.

Table 6

Mediation Effects of Flow Experience

Indirect Path	β	t-value	p-value	Mediation
SRF → FE → EA	0.257	6.91	0.000	Full mediation
TRF → FE → EA	0.291	7.44	0.000	Full mediation

The mediation analysis revealed that flow experience fully mediated the effects of both student-related and teacher-related factors on English achievement. These findings indicate that learning conditions influenced achievement primarily through students' psychological engagement rather than through direct instructional or individual effects.

Summary of Results

Overall, the results provide strong empirical support for the proposed analytical framework. Flow experience emerged as the most powerful predictor of English achievement in blended university EFL classrooms and served as a central psychological mechanism linking both

student-related and teacher-related factors to academic outcomes. While instructional support and learner characteristics were important antecedents of flow experience, their direct effects on English achievement were negligible when flow experience was taken into account. These findings underscore the critical role of learners' psychological experience in determining the effectiveness of blended English learning.

Discussion

This study examined the psychological mechanism underlying English achievement in blended university EFL classrooms by integrating student-related factors, teacher-related factors, and flow experience within a unified quantitative framework. By focusing on CET-4 performance as an objective indicator of academic achievement, the findings contribute to ongoing debates on why blended learning does not consistently lead to improved learning outcomes despite extensive technological and instructional investment. Overall, the results highlight flow experience as the central pathway through which learning conditions are translated into academic performance.

First, the findings demonstrate that flow experience is the most powerful direct predictor of English achievement. Students who reported higher levels of concentration, immersion, and perceived control during blended English learning achieved significantly better CET-4 outcomes. This result aligns with recent empirical evidence in second language acquisition showing that flow experience is positively associated with language performance, persistence, and reduced negative emotions (Piniel & Albert, 2022; Shao et al., 2024). In blended learning contexts, learners are required to self-regulate attention across online and face-to-face components, making sustained psychological engagement particularly critical. The present findings support recent arguments that psychological immersion, rather than technological sophistication, is the key determinant of learning effectiveness in digitally mediated environments (Oga-Baldwin et al., 2022).

Second, the results reveal that student-related factors and teacher-related factors do not exert significant direct effects on English achievement once flow experience is included in the model. This finding helps explain inconsistencies reported in prior blended learning studies, where instructional interventions or learner characteristics yielded mixed effects on academic performance (Li & Cheung, 2023; Zhang & Zhu, 2022). The present results suggest that favorable learner dispositions or supportive teaching practices alone are insufficient to improve achievement unless they successfully foster deep engagement and concentration. This pattern underscores the importance of distinguishing between instructional input and experiential quality, echoing recent calls to refocus blended learning research on learners' internal psychological processes (Bond et al., 2021).

Third, both student-related factors and teacher-related factors were found to significantly predict flow experience. Students with higher self-perceived English proficiency, stronger learning motivation, more positive attitudes toward English, and greater familiarity with learning technologies were more likely to experience flow during blended learning activities. This is consistent with recent quantitative research indicating that self-efficacy, motivation, and language attitudes are critical antecedents of positive emotional engagement in EFL learning (Dewaele & Li, 2022; Teimouri et al., 2023). Similarly, teacher-related factors such as instructional support, teacher enthusiasm, and structured classroom organization

significantly enhanced students' flow experience, corroborating evidence that emotionally supportive and predictable teaching practices facilitate sustained engagement (Keller et al., 2021; Wang, 2022).

The mediation analysis further demonstrates that flow experience fully mediates the effects of both student-related and teacher-related factors on English achievement. This finding extends prior flow research by empirically validating flow as a core psychological mechanism linking learning conditions to high-stakes assessment outcomes in a blended EFL context. While previous studies have documented associations between engagement-related variables and achievement, fewer have explicitly tested mediation models using standardized language outcomes (Shao et al., 2024). The present findings suggest that flow experience functions as a necessary condition for achievement gains: instructional and learner-related advantages only become effective when they are converted into sustained psychological engagement.

Taken together, the findings portray English achievement in blended university classrooms as a psychologically driven process rather than a purely instructional or technological outcome. Achievement emerges from the interaction between learning conditions and learners' experiential states, with flow experience serving as the central mechanism that bridges this relationship. This integrated perspective offers a coherent explanation for why blended learning initiatives often produce uneven results across learners and contexts, despite similar instructional designs. It also aligns with recent critiques of technology-centered pedagogical reforms that overlook the experiential dimension of learning (Zhang & Zhu, 2022).

The findings carry several important implications for blended English instruction in higher education. From a pedagogical perspective, course design should prioritize conditions that facilitate flow experience, such as reducing task fragmentation, providing clear learning goals, offering immediate feedback, and allowing learners a degree of autonomy over learning pace and task selection. These strategies are supported by recent empirical research showing that structured autonomy and goal clarity enhance engagement and performance in language learning environments (Oga-Baldwin et al., 2022). From a professional development perspective, teacher training should move beyond technical platform competence to emphasize psychologically informed instructional design that fosters concentration, control, and sustained engagement.

Despite its contributions, this study has several limitations. The cross-sectional design limits causal interpretation of the observed relationships, and longitudinal research is needed to examine how flow experience develops over time and influences learning trajectories. In addition, although CET-4 scores provide an objective indicator of English achievement, student-related and teacher-related factors were measured through self-reported perceptions, which may be subject to response bias. Future studies could integrate learning analytics, classroom observation, or experimental designs to triangulate these findings and further validate the proposed mechanism.

In conclusion, this study provides robust quantitative evidence that flow experience plays a central mediating role in shaping English achievement in blended university EFL classrooms. By demonstrating that student-related and teacher-related factors influence achievement

primarily through learners' psychological engagement, the findings advance understanding of blended learning effectiveness and underscore the importance of prioritizing experiential quality in higher education English instruction.

Conclusion

This study investigated the psychological mechanism underlying English achievement in blended university EFL classrooms by integrating student-related factors, teacher-related factors, and flow experience within a single empirical model. By adopting a quantitative research approach and structural equation modeling, the study provides evidence that English achievement in blended learning contexts is shaped not simply by instructional conditions or learner characteristics, but by the quality of learners' psychological engagement during the learning process.

The findings confirm that English achievement cannot be attributed to any single instructional or individual factor. Instead, achievement emerges from the interaction between learning conditions and learners' internal experiences. Student-related factors influence how learners perceive their abilities, regulate their learning, and engage with instructional tasks, while teacher-related factors function as contextual conditions that shape the structure, emotional climate, and coherence of blended English classrooms. However, these factors exert their influence on achievement primarily through flow experience, rather than through direct effects on test performance.

By demonstrating the mediating role of flow experience, this study advances understanding of how blended English learning produces academic outcomes. Flow experience serves as a critical psychological pathway through which both student-related and teacher-related factors are translated into measurable English achievement. The results suggest that instructional quality and learner preparedness alone are insufficient to improve performance unless they foster sustained concentration, a sense of control, and deep engagement during learning. In this sense, flow experience is not an ancillary emotional state but a central mechanism underpinning effective learning in blended EFL environments.

From a practical perspective, the findings offer important implications for blended English instruction in higher education. Course design should move beyond an emphasis on technological integration and content coverage toward creating learning conditions that facilitate psychological immersion. Teachers should design coherent learning tasks, provide clear goals and timely feedback, and reduce unnecessary task fragmentation to support sustained engagement. At the same time, instructional practices should acknowledge individual differences among learners and support the development of positive learning dispositions that increase students' capacity to experience flow.

This study also contributes to the broader literature on blended learning and second language education by empirically validating a psychologically grounded perspective on learning effectiveness. Rather than treating achievement as a direct outcome of instructional input, the findings conceptualize achievement as a dynamic result of interaction between contextual conditions and learners' experiential states. This perspective may be useful for future research examining learning outcomes in other digitally mediated or hybrid educational settings.

Several limitations should be noted. The cross-sectional design restricts causal interpretation of the observed relationships, and future research could employ longitudinal or experimental designs to examine how flow experience develops over time and influences learning trajectories. In addition, while CET-4 scores provide an objective indicator of English achievement, student-related and teacher-related factors were measured through self-reported perceptions, which may introduce response bias. Future studies could incorporate learning analytics or observational data to triangulate these findings.

In conclusion, this study provides empirical support for the view that English achievement in blended university EFL classrooms is achieved through the combined and indirect effects of student-related and teacher-related factors operating via flow experience. By clarifying the mechanism through which learning conditions are transformed into academic outcomes, the study offers valuable insights for educators, curriculum designers, and researchers seeking to enhance the effectiveness of blended English education in higher education.

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