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Blended Learning for EFL Speaking Development in Chinese Higher Education: Differential CAF Gains and the Attitude-Mediated Pathway from Course Experience to Motivation

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Abstract

This paper examines the efficiency of a blended learning speaking course in English as a Foreign Language (EFL) students in Chinese higher education and focuses on the differential learning gains in complexity, accuracy, and fluency (CAF) and the mediator role of learners' attitudes. Based on quantitative results of pre- and post-speaking tests and on questionnaire responses, the research discusses (a) whether students achieved significant improvements in speaking performance at the end of the blended course, (b) what CAF dimensions had the most salient gains, and (c) how the learners' attitudes towards blended learning mediated the relationship between course experience and learning motivation.

Keywords: Blended Learning, EFL Speaking, Complexity, Accuracy and Fluency, Learner Attitude, Motivation, Higher Education

Introduction

In recent years, blended learning has become a major trend in higher education, driven by digital transformation and post-pandemic instructional shifts (Adigun et al., 2024; Alammary, 2019). Within broader social science debates on educational equity, learner agency, and technology-mediated learning, blended learning is increasingly viewed not merely as a technical approach but as a socially situated practice that shapes learners' engagement and developmental outcomes (Andujar and Nadif, 2020). However, existing EFL research has largely focused on overall speaking proficiency or learner perceptions, providing limited evidence on how blended instruction influences specific linguistic dimensions of speaking performance and the affective mechanisms that sustain motivation(Yu et al., 2025).Given the persistent challenges of EFL speaking development in Chinese universities, a clearer understanding of both performance gains and motivational processes is theoretically and practically significant. Therefore, this study addresses this gap by examining differential gains in complexity, accuracy, and fluency (CAF) and by testing learner attitude as a mediating pathway linking perceived course experience to learning motivation.

One of the four key language skills, speaking, is broadly considered as one of the hardest among EFL learners, particularly in the input-rich but low-output instructional settings like those prevalent in Chinese universities (Anthony et al., 2020). Speaking instruction in a traditional classroom setting might not offer a sufficient amount of sustained oral practice, personalized feedback, and learner autonomy (Bhagat et al., 2021). Consequently, learners can display weaknesses in fluency, continued grammatical errors, and limited lexical and syntactic complexity in oral production (Bhagat et al., 2021). Blended learning is suggested as one of the pedagogical solutions to these issues because it could protract oral practice outside the classroom by using online activities, asynchronous oral production, and technology-mediated interaction (Boelens et al., 2017).

The positive impact of blending learning on EFL speaking development is recorded in empirical research more recently (Boelens et al., 2017). Past researches have indicated that the use of blended instructional design improves general speaking proficiency, confidence, and student engagement (Broadbent, 2017). Nonetheless, a significant number of the available researches are based on holistic speaking scores or subjective perceptions, and this can potentially blur the process through which certain linguistic aspects of speaking develop. To narrow down more precisely, the literature that has embraced the complex, accuracy, and fluency (CAF) framework to study the development of speaking in a remote learning context is quite limited, though it is one of the fundamental points of the second language acquisition (Cai, 2025).

CAF framework conceptualises a second language performance as a multidimensional concept, which is a blend of linguistic complexity, accuracy, and fluency (Cao, 2023). It is also stated that these dimensions develop at varying rates and respond to the instructional interventions differently (Cao, 2023). Specifically, it is possible to show that fluency is responsive to increased practice opportunities, whereas complexity can be learned much more slowly, and it may require prolonged exposures and explicit instruction from educators (Zheng and Lee, 2023). Using the CAF framework in blended learning contexts thus enables the more detailed analysis of how technology-enhanced instruction may influence various features of EFL speaking performance (Zheng and Lee, 2023).

Besides performance outcomes, learners' affective factors are very important in the effectiveness of blended learning. The learners’ attitudes towards blended learning and their perceptions of flexibility, usefulness, and ease of use have been found to affect engagement and persistence (Zhong, 2013). Motivation is among the important factors influencing long-term language learning effort and achievement. Though in the past some researchers have researched the attitudes and motivation independently, few have empirically tested the psychological mechanism by which blended learning experience impacts learner motivation (Zimmerman, 1989). In particular, the moderating role of learner attitudes linking course experience and motivation is not well-explored in EFL speaking research.

To fill the gaps, the current paper examines the efficiency of a blended EFL speaking course in Chinese higher education by integrating a CAF-based speaking assessment approach and an affective-motivational perspective. Based on pre and post speaking test and questionnaires, the study not only focuses on whether learners can show significant improvement in speaking performance but also how the change can be differentiated in terms of complexity, accuracy, and fluency. In addition, the paper examines the role of learner

attitudes to blended learning in mediating the relationship between course perceived experience and learning motivation.

In this way, this study contributes to the literature in two aspects. First, it expands research in the field of blended learning by offering empirical evidence on differential CAF gains in EFL speaking development. Second, it advances the understanding of the affective processes in the effectiveness of blended learning through modeling learner attitude as a mediating variable. The results provide pedagogical knowledge about designing blended speaking courses in higher education and add to the discussion around the facilitative role of technology-enhanced learning environments in the process of second language development. Accordingly, this study addresses the following research questions:

RQ1. Does participation in a blended learning speaking course lead to significant improvement in EFL learners' overall speaking performance in Chinese higher education?
RQ2. How does EFL learners' speaking development differ across the dimensions of complexity, accuracy, and fluency (CAF) in a blended learning context?
RQ3. Do learners' attitudes toward blended learning mediate the relationship between perceived course experience and learning motivation?

Literature Review

Blended Learning in EFL Education

Blended learning typically refers to the instructional model that logically integrates classroom instruction with online learning tasks (Zimmerman, 1989). In EFL education, blended learning has been applied widely to address certain shortcomings of conventional education, such as inadequate classroom time, unequal student interaction, and inaccessibility to personalised practice (Andujar and Nadif, 2020). Blended learning classrooms allow students to interact with the input and output of languages beyond the classroom and, in the process, prolong the learning time and increase learner autonomy through the introduction of online components (Boelens et al., 2017).

Even in EFL contexts, blended learning has been empirically proven to have positive outcomes (Broadbent, 2017). These are increased learner engagement, improved language proficiency, and improved learner attitude towards the learning process. Particularly, blended learning has been demonstrated to improve interaction, provide flexible learning opportunities, and support differentiated instruction (Cai, 2025). Nonetheless, the success of blended learning is extremely reliant on pedagogical design, and not every blended course produces similar learning outcomes (Cao, 2023). Such inconsistency emphasizes the need for empirical research that not only addresses the question of whether blended learning is effective but also how and why it works in certain areas of skills.

Blended Learning and EFL Speaking Development

Speaking is a skill that needs a lot of practice, timely feedback, and meaningful interaction opportunities. In conventional EFL classrooms, particularly in the higher education setting with a high number of students in the classroom, time and logistical limitations frequently constrain speaking teaching (Alammary, 2019). Consequently, learners are deprived of the chance to generate substantial oral production, therefore, inhibiting the development of fluency and accuracy (Zheng and Lee, 2023).

Blended learning has been suggested as a pedagogical response to these challenges. Online speaking tasks, e.g., video recordings, voice discussions, and asynchronous oral presentations, allow the learners to practice speaking at their speed and alleviate performance anxiety (Zheng and Lee, 2023). Empirical studies have shown that blended speaking teaching may enhance the oral competency, confidence, and willingness to communicate among learners (Alammary, 2019). However, a large proportion of this research assesses speaking development based on overall proficiency scores or self-report measures, which do not give much information on the particular linguistic dimensions influenced by blended learning (Broadbent, 2017).

CAF Framework in Second Language Speaking Research

The complexity, accuracy, and fluency (CAF) model is a framework that has been extensively utilized in the analysis of second language performance and development (Alammary, 2019). Complexity is linked to the extent and sophistication of the linguistic systems, accuracy is connected to the level of error-free use of language, and fluency to the pace and smoothness of speech production (Broadbent, 2017). Studies in this context have shown that the dimensions are partly independent and can take different directions under instructional pressure.

Past research has also indicated that fluency tends to increase with increased practice opportunities, whereas accuracy benefits from feedback and focused attention on form (Cao, 2023). Complexity, in turn, is more likely to develop slowly and is affected by proficiency level and task demand among the learners (Zhong, 2013). The application of the CAF framework to blended learning situations enables the researcher to determine what dimensions of speaking performance are the most sensitive to technology-enhanced learning and what domains need more pedagogical assistance (Broadbent, 2017).

Although it is relevant, the CAF framework has been underutilised in EFL speaking blended learning research (Broadbent, 2017). Most of the current studies do not disaggregate speaking performance in CAF components, thus restraining their explanatory capacity. Such a gap implies that it is necessary to conduct research that integrates the concept of blended learning with fine-grained performance analysis.

Learner Attitudes toward Blended Learning

Attitudes Learner attitudes are an important factor that influences engagement and learning results in a blended environment (Zhong, 2013). Attitudes towards blended learning include perceptions learners have about the usefulness, ease of use, flexibility, and satisfaction. Increased Participation, persistence, and the role of self-regulated learning have been linked to positive attitudes (Anthony et al., 2020).

Learners who view blended learning as helpful and manageable tend to actively engage in online speaking tasks in EFL settings and dedicate long-term investment to the language practice (Bhagat et al., 2021). On the other hand, negative perceptions towards technology or instructional design can hinder willingness to participate, thus minimizing the possible benefits of blended learning (Bhagat et al., 2021). Nonetheless, learner attitudes are frequently considered an outcome variable instead of an explanatory factor in empirical research (Broadbent, 2017).

Attitude as a Mediator between Course Experience and Motivation

Motivation is a key construct in second language learning and has an impact on efforts, persistence, and achievement of learners. Motivation is often explored in studies on blended learning as a direct outcome of instructional design or technology usage (Broadbent, 2017). Theoretical and empirical studies, however, posit that the subjective perceptions of learning experiences shape motivation responses of learners (Zheng and Lee, 2023).

In this sense, the learner attitude may be modeled as a mediating variable between the course experience and motivation (Zheng and Lee, 2023). Positive course experiences can result in a positive attitude about blended learning, which further boosts the motivation of learners to participate in speaking exercises (Broadbent, 2017). There are still only a few experimental studies that test such mediation models, especially in EFL speaking instruction.

To address this gap, the current study placed the learner attitude within the affective-cognitive process in which motivation is shaped by blended learning experience. This study integrates the performance-based CAF analysis and a mediation model that gives a more holistic view of the linguistic and psychological dimensions of EFL blended speaking development.

Methodology

Research Design

The research utilized a quantitative pretest and posttest study design to test the effectiveness of a blended learning speaking course on the speaking development and motivation of EFL learners. The design was to (a) to measure the differences in the speaking performance of the learners in the blended course before and after it (b) compare the differences in gains by the learners on different dimensions of complexity, accuracy, and fluency (CAF), and (c) to test whether the attitude of the learners regarding blended learning mediated the relationship between the perceived course experience and the learning motivation.

To address these objectives, speaking performance data were gathered at two points in time, and questionnaire data were gathered at the end of the course. This design had been adopted to allow the evaluation of outcomes as well as the exploration of mechanisms in the same empirical framework.

Participants and Context

The respondents were undergraduate students enrolled in a mandatory course in English speaking taught in a comprehensive university in China. All participants were non-English majors and had formal training in English over a number of years before the study. The course was a one-semester academic course using a blended learning model that incorporated face-to-face learning with online speaking activities.

The face-to-face part involved speaking strategies, guided practice, and classroom interactive tasks, whereas the online component included an asynchronous speaking assignment, video-based oral production, peer feedback, and a self-paced practice assignment. For the two elements, participation was mandatory as part of course evaluations. All participants did the pretest and posttest speaking tasks and questionnaire at the end of the course, and these were included in the final analysis.

Instructional Design of the Blended Speaking Course

The blended speaking course was designed to increase the oral practice experience beyond the classroom and reduce the anxiety learners feel about speaking performance within the classroom. The online speaking tasks involved recording short oral responses and speaking in topic-based speaking activities, as well as submitting audio or video recordings in order to receive feedback. These activities enabled the learners to rehearse, self-monitor, and polish the spoken output before it could be submitted.

The face-to-face sessions focused on communicative practice, interaction, and feedback, which helped to reinforce and add to the online learning experience. The correspondence between the online and offline elements was purposefully created so that it would help to maintain the pedagogical coherence and facilitate the continuous speaking development during the semester.

Instruments

Speaking Tests

The speaking performance of learners was evaluated based on standardised speaking tasks that were given at the beginning and the end of the course. The tasks were constructed to induce prolonged oral production, and they were similar in topic familiarity and cognitive demand during the two testing occasions.

Analytic ratings of speaking performances were based on the CAF framework with separate scores for the complexity, accuracy, and fluency. The complexity was used to represent the diversity and sophistication of linguistic structures, the accuracy implied the extent of error-free language use, and the fluency was determined by the smoothness and speed of speech production. The speaking samples were rated by two trained raters independently, and the inter-rater reliability was determined before scoring.

Questionnaire

To evaluate the perceived course experience, attitudes towards blended learning, and motivation to learn, a questionnaire was given to learners at the end of the course. Each item was rated on a Likert-type scale. The attitude scale measured the perception of usefulness and flexibility, as well as the overall acceptance of blended learning among the learners, whereas the motivation scale measured the effort, interest, and intentions of the learners to continue enhancing their speaking ability.

The questionnaire revealed acceptable internal consistency, with the Cronbach's alpha values being higher than accepted. The composite scores of each construct were computed and subsequently analyzed.

Data Analysis

Paired-sample t-tests were used to test the pre- post difference in overall speaking performance and in the individual CAF dimensions. Effect sizes were calculated to estimate the magnitude of the gains observed. In order to examine the psychological process that underlie motivational results, mediation analysis was conducted to determine whether learner attitudes towards blended learning mediated the relationship between perceived course experience and learning motivation. All the statistical analyses were done with the

help of the standard statistical programs. Parametric testing assumptions were verified beforehand, and the level of significance was determined at a conventional threshold.

Results

Overall Speaking Performance

To analyze whether participation in the blended speaking course resulted in an improvement in the speaking ability of the learners, paired sample t-tests were used to compare the pretest and posttest speaking scores. The findings showed that there was a statistically significant difference between pretest and posttest in overall performance in speaking. The effect size indicated that there was a significant change in oral proficiency among learners after the blended learning intervention.

Differential Gains in Complexity, Accuracy, and Fluency

Additional analyses were carried out to investigate the changes in the three CAF dimensions. As indicated in the paired comparisons, the learners showed considerable gains in fluency and accuracy after the blended speaking course. The largest improvement was in fluency, which suggested that the speech of the learners became more natural and automatic throughout the semester. There was also an improvement in accuracy, which implied decreased linguistic error in the spoken output of learners.

By comparison, complexity gains were comparatively smaller. The improvement in complexity was not as large as that of fluency and accuracy, although a positive trend was observed. This trend implies differential developmental paths in CAF dimensions in the blended learning environment.

Comparison of Effect Sizes across CAF Dimensions

The effect size analyses also validated the difference in the effect of the blended speaking course on CAF development. The effect size of fluency was large, followed by the medium effect size on accuracy. The complexity effect was small, meaning that there was a more limited short-term development in linguistic sophistication.

These findings suggest that the blended learning setting was especially useful in facilitating the areas of speaking performance that can be improved by means of practising and that have reduced processing pressures.

Mediation Analysis: Attitude as a Mediator

Mediation analysis was performed in order to investigate the hypothesis on whether attitudes of learners towards blended learning mediated the relationship between perceived course experience and learning motivation. The findings indicated that perceived course experience was a significantly important predictor of learners' attitude towards blended learning. Learner attitudes, in turn, were an important predictor of learning motivation.

When the learners' attitudes were included in the model, the direct correlation between the course experience and motivation was also lower yet significant, pointing to partial mediation. This observation demonstrates that positive course experiences directly and indirectly positively impacted the motivation of learners as they were connected with a positive attitude towards blended learning.

Discussion

The current research investigated how a blended learning speaking course influenced speaking development among EFL students and affective mechanisms between course experience and motivation (Boelens et al., 2017). The results reveal both empirical data on the efficiency of blended learning in terms of boosting EFL speaking performance as well as the differences in developmental growth patterns in the dimensions of complexity, accuracy, and fluency (CAF) (Broadbent, 2017). Besides, the mediation analysis indicates that the learners' attitudes are a noteworthy psychological channel through which the mechanisms of blended learning experience influence motivation.

Blended Learning and Differential CAF Development

Among the most important results of the present research is that the students actually improved their overall speaking performance by participating in the blended learning course (Boelens et al., 2017). The observation is correlated with earlier studies, which indicate that blended learning can be practical in terms of promoting the development of oral language by offering more practice opportunities and reducing the restrictions that accompany conventional classroom-based education (Broadbent, 2017).

More significantly, the findings indicate differential gains in CAF dimensions. The largest improvement was made on fluency, then accuracy, and the gains in complexity were average (Cai, 2025). The trend is also aligned with the previous findings in this field that have indicated that generally, fluency depends on the increased availability of repetition practice tasks and reduced time limitations (Cao, 2023). Online speaking tasks in the current blended learning situation provided learners with the opportunity to rehearse and self-monitor and provide oral output in a low-anxiety situation, which probably promoted the growth of speech flow and automaticity.

This increased accuracy can be explained by access to feedback and revision opportunities in a blended course design. Online speaking assignments helped the learners to self-assess their language use and correct their mistakes before final submission, and face-to-face sessions also assisted in providing extra feedback and reinforcement (Cao, 2023). Conversely, the comparatively small gains in complexity imply that short periods of blended instructional methods might not be effective when it comes to promoting structural sophistication that might take long-term exposure, greater proficiency of application, and targeted teaching attention.

Attitude as an Affective Mechanism in Blended Learning

In addition to the performance results, this work will contribute to blended learning studies by establishing learner attitude as a mediating variable between course experience and motivation (Cao, 2023). According to the mediation analysis, more positive attitudes towards blended learning were related to positive perceptions of course experience, and, subsequently, positively influenced the motivation of learners (Broadbent, 2017). This observation coincides with the socio-cognitive perspective of language learning, which highlights the subjective interpretation of the learning context by learners as one of the major determinants of motivational responses.

Instead of being used as an outcome variable, the learner's attitude in this study served as an affective-cognitive process that mediated between instructional experience and motivational engagement (Broadbent, 2017). This finding builds on earlier studies by empirically establishing that blended learning has an indirect impact on motivation through influencing learners' attitudes towards the mode of learning. It also clarifies the reason as to why the same blending design can produce varying motivational results among learners or situations.

Integrating Performance and Affective Perspectives

This research provides a more comprehensive explanation of the effectiveness of blended learning by integrating CAF-based speaking assessment with an attitude-mediated motivational model (Cao, 2023). According to the evidence provided, the speaking performance improvements and the growth in motivation are interlinked but not the same processes (Boelens et al., 2017). Although the improvement of fluency and accuracy is an indication of the cognitive and linguistic advantages of blended learning, motivational effects are influenced by the affective reactions of learners towards the learning environment.

This integration emphasizes the necessity to take into account the performance-based and psychological aspects when assessing technology-enhanced language instruction (Boelens et al., 2017). Blended learning designs that concentrate on the number of tasks or technological features only will not achieve their full potential when they disregard the learners' attitudes towards the mode of learning.

Pedagogical Implications

The findings of this study have several pedagogical implications for EFL speaking instruction in higher education (Boelens et al., 2017). First, blended speaking courses should prioritize fluency-oriented tasks that encourage repeated oral production and reduce performance anxiety, particularly in contexts where classroom speaking opportunities are limited (Cai, 2025). Second, accuracy development can be supported through feedback-rich online tasks that allow for reflection and revision. Third, promoting linguistic complexity may require more explicit instructional scaffolding and longer-term pedagogical interventions (Cai, 2025).

Furthermore, the attitude of learners towards blended learning should be managed by the instructors, ensuring online learning environments are accessible, tasks are relevant within the context of face-to-face learning, and goals are clear. Positive attitudes in students can not only increase motivation but also improve the effectiveness of blended speaking instruction.

Conclusion

This research paper explored the effectiveness of a blended learning speaking course among learners of the EFL in the context of Chinese higher education, especially in terms of the difference in development across complexity, accuracy, and fluency in terms of CAF, and the influence of course experience on motivation (Cai, 2025). The study combines performance-based speaking with a mediation model to offer empirical evidence on the linguistic and psychological aspects of blended EFL speaking instruction.

Results indicate that overall speaking performance in blended learning may lead to significant improvements, with fluency showing the most significant gains, then accuracy, and complexity demonstrates less prominent short-term development (Zheng and Lee, 2023). The

results point to blended learning environments being highly advantageous, especially within elements of speaking performance that can be enhanced by greater opportunities for practice, lower processing pressure, and high-feedback learning environments. Simultaneously, the insignificant complexity gains suggest that the structural sophistication might need prolonged or more specific instructional interventions.

In addition to the performance outcomes, this research identifies the role of the attitude of learners in understanding the motivational effect of blended learning (Zheng and Lee, 2023). The mediation test indicates that the learners' attitudes towards blended learning partially mediate the correlation between perceived course experience and learning motivation. This observation reiterates the earlier idea that the success of blended learning does not depend on the design of instruction or technological capabilities exclusively but also on the affective-cognitive appraisals of the learning context among learners (Zimmerman, 1989).

Combined, the findings indicate that an effective blended speaking instruction needs to be designed with consideration of both the psychological and pedagogical aspects (Zimmerman, 1989). In practice, it is recommended that instructors include fluency-based and feedback-based speaking activities, and still maintain coherence between the online and face-to-face elements (Zimmerman, 1989). The necessity of creating positive learner attitudes toward blended learning, through creating purposeful tasks, manageable technical needs, and supportive learning experiences, is equally significant (Cao, 2023).

The study has a number of limitations that should be noted. This is because the findings can be generalized using only one institutional context, and the intervention duration might not have been long enough to predict the long-term growth in speaking complexity (Cao, 2023). In future studies, the longitudinal or mixed-method research approach can be considered to investigate more in detail how blended learning would impact various aspects of speaking development over time, and how affective variables would affect the instructional design in various types of learning environments (Broadbent, 2017).

To sum up, the present research study adds to the body of literature about blended learning and EFL speaking by demonstrating that blended instruction can be used effectively in promoting speaking development while functioning through recognizable affective mechanisms. The study integrates CAF analysis and an attitude-mediated motivational model, providing a more detailed framework for analyzing and designing blended speaking courses in higher education.

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