Integrated Model for Adoption of Blended Teaching in Teaching Chinese as a Foreign Language

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A R T I C L E I N F O	A B S T R A C T
	Purpose: This study investigates the use of hybrid teaching methods in Chinese language instruction for non-native learners. It combines the Technology Acceptance Model (TAM) with the Theory of Planned Behaviour (TPB) to analyse the factors that affect educators' intention and actual use of technology in educational environments. **Method:** This study utilises purposive sampling to collect data from 542 qualified instructors of Teaching Chinese as a Foreign Language (TCFL) who have experience in blended teaching at Confucius Institutes. Structural Equation Modelling (SEM) was employed for data analysis.

Findings: The study findings indicate that educators' attitudes, subjective norms, perceived ease of use, and perceived usefulness significantly influence their adoption of blended teaching methods, which in turn affects their implementation in practice. **Implications for Research and Practice:** This study emphasises the intermediary roles of perceived ease of use and behavioural intention. This study strengthens our theoretical comprehension and practical implementation of integrating technology in education, particularly in the domain of teaching Chinese to non-native learners.

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Introduction

In the digital era, a discernible transformation of educational paradigms is evident, particularly within the sphere of language pedagogy (Jiang et al., 2024). The concept of blended teaching, which amalgamates network technology with traditional classroom methods, has become increasingly relevant (Jiang et al., 2021). The shift is significant in the context of China's Industry 4.0, highlighting the importance of digitalization in education. The widespread global spread of Chinese language and culture presents both opportunities and challenges, particularly in the area of teaching Mandarin to non-native speakers (Koh, Hoon, & Haji-Othman, 2021).

The recognition of Mandarin as a valuable second language is increasing globally due to China's growing influence and the process of globalisation (Koh et al., 2021). Chinese, as one of the most widely spoken languages globally, plays a vital role in facilitating trade, cultural exchanges, and promoting a comprehensive understanding of China's cultural and business environment (Gao, 2020) Proficiency in Chinese can lead to personal and professional growth, expanding job opportunities in multinational corporations and international organisations (Li, Zhao, & Han, 2020). Learning Chinese promotes cultural exchange and appreciation of its rich heritage, thus enhancing global diversity. Nevertheless, the challenges posed by the complexity of the Chinese language and the requirement for extensive learning resources remain, underscoring the need for greater investment in Chinese language education to enhance its global influence and accessibility (Chen et al., 2022).

The instruction of Mandarin to non-native speakers has traditionally focused on in-person, conventional methods, typically led by teachers residing overseas (Gong, Gao, & Lyu, 2020). The effectiveness and efficiency of acquiring new languages can be improved using hybrid learning approaches. However, Mandarin language educators appear to have limited involvement with this innovative teaching method, despite its advantages. Educators who are accustomed to traditional, in-person teaching styles encounter difficulties in establishing captivating and emotionally stimulating online learning environments. The research conducted by Soon et al. (2021) highlights the significant underutilization of hybrid learning resources due to a lack of proficiency in effectively utilising online tools.

In addition, Xu, Zhang and Parr (2023) discussed the challenges associated with adapting to new educational practices. These insights are applicable to Chinese language teaching, despite their focus on English as a Foreign Language (EFL) instruction. The challenges include adapting to diverse educational cultures and the important task of strengthening teacher identity in the context of globalisation (Sahling & De Carvalho, 2021). The incorporation of Open Educational Resources (OER) highlights the importance of proficient technology integration and professional development in blended teaching settings.

The balance in blended teaching is considered a crucial factor for Chinese as a foreign language teacher (Alsheikhidris, 2020). The balance required includes both technical proficiency in digital tools and the ability to sustain emotional engagement and interaction with students in various settings, whether online or offline. Therefore, achieving this balance is essential for improving the learning experience, particularly in the digital era and with the expanding global influence of Chinese language education (Liu et al., 2023).

Blended education focuses on the learner's perspective, emphasising factors such as motivations, experiences, teaching methods, and influences on the adoption of blended learning. The use of blended teaching methods in English language instruction has garnered attention, but the research in this area remains limited, with a focus on literature reviews rather than empirical investigations (Hiebl, 2023). Blended teaching methodologies are increasingly being used in disciplines such as mathematics, English, physical education, and engineering (Cooke et al., 2021). However, there is an imbalance in the field of TCFL, as the emphasis is primarily on studying students' engagement with blended learning environments. This highlights a notable lack of research that investigates instructors' approaches to blended teaching, particularly in terms of empirical investigations (Graham et al., 2019). This gap emphasises the need for further research to be conducted to promote the adoption of blended teaching by educators. This is crucial for aligning with the development of digital pedagogy and effectively promoting the Chinese language and culture (Yoganathan & Osburg, 2024).

This study aims to develop a comprehensive model that elucidates the factors that impact the adoption of blended teaching methodologies among TCFL instructors. The model is based on the TAM and the TPB. This study aims to offer insights to stakeholders on strategies to improve the domain of TCFL.

The literature review section follows the introductory segment and includes the theoretical framework, definition of relevant variables, and explanation of the empirical model used in this study. The third section provides an overview of the data collection methodology, including the creation of the survey instrument and the analysis methods used. The fourth segment presents the study's findings. The fifth section serves as a thorough discussion and conclusion, addressing both theoretical and practical implications. This section critically evaluates the limitations of the current research and suggests potential directions for future scholarly investigation.

Literature Review

The TPB and TAM are fundamental models for analysing behavioural intentions and technology adoption. The TPB provides a comprehensive framework for predicting behaviours in different domains, with a focus on intention, attitudes, subjective norms, and perceived control (Dong, Wang, & Han, 2022; Sahu, Padhy, & Dhir, 2020). TAM specifically examines the relationship between technology use and perceived ease and usefulness, suggesting that these factors strongly influence intentions and actual usage. This framework offers valuable insights into the dynamics of technology acceptance (Kamal, Shafiq, & Kakria, 2020).

The integration of TPB and TAM offers a comprehensive framework for predicting behaviours in technology-mediated environments, including blended teaching (Yu, Dai, & Wang, 2023). This study combines the broad behavioural insights of the TPB with the specific focus on technology of the TAM. This approach provides a detailed understanding of the factors that influence the adoption of blended teaching methods (Zhang et al., 2022).

The amalgamation of the TAM and the TPB in blended teaching adoption has identified research gaps that present an opportunity for scholarly innovation (Ohanu et al., 2023).

Parkhouse, Lu and Massaro (2019) offer valuable insights into specific cultural contexts and individual perspectives, but there is a lack of comprehensive research that includes a wider range of cultural settings and examines both educator and student viewpoints simultaneously. Moreover, the ever-changing and dynamic nature of technology in the field of education requires continuous research to comprehend its influence on the adoption of blended learning. In their study, Yu et al. (2023) employed both the TAM and the TPB to evaluate the behavioural intentions of university students when it comes to utilising blended learning systems. To address these gaps, this study aims to provide a comprehensive analysis of the TAM and the TPB in a unified framework. Additionally, it considers the longitudinal changes in attitudes and behaviours towards blended teaching in TCFL. In addition, it aims to explore the practical challenges and factors that contribute to the implementation of educational technology in TCFL from an institutional perspective. This will provide a unique and comprehensive understanding of the field.

Hypothesis Development

The integration of the TPB and TAM has enhanced our comprehension of technology adoption, specifically in relation to the promotion of positive attitudes towards emerging technologies like blended teaching (Bervell, Nyagorme, & Arkorful, 2020). Wong et al. (2024) emphasise the positive impact of behavioural attitudes from the TPB and the perceived usefulness and ease of use from the TAM on technology adoption inclination. The convergence of the TPB and the TAM constructs is crucial in promoting favourable attitudes and intentions towards innovative educational methodologies, like blended teaching. Ramadania and Braridwan (2019) emphasise the importance of system quality in improving these perceptions, indicating a significant impact on the adoption process. Ming, Jotikasthira and Songyu (2023) supports the notion that combining TPB and TAM is effective in fostering a positive technological mindset, which is essential for the adoption of blended teaching methods. The findings confirm the important role of TPB and TAM in facilitating technology adoption, as evidenced by their impact on positive attitudes towards blended teaching (Virani, Saini, & Sharma, 2023).

H1: *Positive attitudes towards BT significantly influence the intention to adopt BT in TCFL.*

Ming et al. (2023) emphasises the importance of subjective norms, a key element of the TPB, in influencing individuals' intentions to adopt new technology. Fu, Jiang and Deeprasert (2023) conducted research that supports the notion of subjective norms having a positive and significant impact on users' intention to adopt cloud computing services. Similarly, Jiang, Jotikasthira and Pu (2022) found that subjective norms significantly predict behavioural intention, highlighting their influence on technology adoption and educators' willingness to adopt hybrid teaching methods. The studies confirm the significant impact of subjective norms on the acceptance of innovative technologies and teaching approaches. The studies indicate that subjective norms, as defined in the TPB, play a significant role in influencing the intention to adopt new technologies and methods, such as hybrid teaching (Abbasi et al., 2022). Hence, we posit：

H2: *Subjective norms positively impact on the intention to adopt blended teaching (BT) in Teaching Chinese as a Foreign Language (TCFL).*

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Scholars investigated the impact of seven constructs on behavioural intentions (BI), specifically focusing on PU and PEOU. Their research confirmed that all proposed hypotheses were valid, except for the PU-PEOU linkage. The study found that PU has a significant impact on satisfaction, self-efficacy, and BI. Additionally, PEOU is influenced by course quality. The results highlight the importance of PU and PEOU in promoting a favourable intention to adopt blended teaching methods.

The study conducted by Sabah (2020) found that perceived ease of use, perceived usefulness, attitude, subjective norms, and perceived behavioural control have significant effects on both the intention to use and the actual implementation of blended learning. Siala, Kutsch and Jagger (2020) emphasised that attitudes towards the adoption of serious games are influenced by perceived confidence and ease of use, which are important predictors of adoption intentions. Building on these insights for blended teaching in TCFL, the proposed hypotheses are:

H3: *Perceived ease of use of BT directly influences the intention to adopt BT.*
H4: *Perceived usefulness of BT directly influences the intention to adopt BT.*
H5: *Perceived usefulness of BT enhances the perceived ease of use of BT.*
H6: *The intention to adopt BT leads to its actual adoption in TCFL.*

Padmawidjaja (2023) and Yu et al. (2023) discovered that PU and PEOU have a significant impact on behavioural intentions, usage, satisfaction, and learning attitudes towards technology, ultimately influencing motivation to utilise blended learning. The results demonstrate how adoption intentions connect attitudes, subjective norms, PEOU, and PU to the actual adoption of blended teaching, aligning with the TPB and the TAM. Based on this, the study proposes:

H7: *Intention to adopt BT mediates the impact of attitudes towards BT on its adoption in TCFL.*
H8: *Intention to adopt BT serves as a mediator between subjective norms and the adoption of BT in TCFL.*
H9: *The relationship between the perceived ease of use of BT and its adoption in TCFL is mediated by the intention to adopt BT.*
H10: *Intention to adopt BT mediates the influence of perceived usefulness on the adoption of BT in TCFL.*

Caffaro et al. (2020) and Tahar et al. (2020) found that PU and PEOU have a direct impact on farmers' intentions to adopt technology. Additionally, Tahar et al. (2020) observed that PU and PEOU positively influence attitudes, which in turn affect intentions to use technology. The studies emphasise the role of PEOU in connecting PU with adoption intentions, confirming its significance in the TAM and TPB for the adoption of BT. Thus, this research suggests:

H11: *Perceived ease of use of BT mediates the impact of perceived usefulness on the intention to adopt BT.*
H12: *Perceived ease of use of BT also mediates the relationship between perceived usefulness and the actual adoption of BT in TCFL.*

Research Method

The study employed an online survey method and purposive sampling to collect data from 542 instructors involved in TCFL with varying levels of teaching experience. Table 1

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presents a breakdown of the participants' involvement with blended teaching methods in TCFL. The gender distribution indicates a slight male predominance, with 55.2% male and 44.8% female participants. The age groups in the study range from under 30 to over 50, with a diverse representation across various stages of adulthood. This diversity allows for a wide range of perspectives on blended teaching (Leanos et al., 2023). The range of teaching experience spans from less than a year to over ten years, providing valuable perspectives on the adoption of blended teaching at different stages of career development. All participants possess a high level of education, with everyone holding at least a bachelor's degree. The distribution of educational backgrounds is even, with a similar number of participants holding bachelor's, master's, and Ph.D. degrees.

Table 1

Essential Information of the Participants

		Frequency	Percent
Gender	Male	299	55.2
	Female	243	44.8
Age	<30	77	14.2
	30-35	98	18.1
	35-40	86	15.9
	40-45	97	17.9
	45-50	77	14.2
	>50	107	19.7
Teaching experience	<1year	112	20.7
	1-3years	114	21.0
	3-5years	103	19.0
	5-10years	111	20.5
	>10years	102	18.8
Education level	Bachelor	183	33.8
	Master	186	34.3
	Ph.D	173	31.9

The survey, conducted over a one-month period, produced a significant quantity of valid responses. The questionnaire was organised into seven sections, as detailed in Appendix 1. The initial section gathers fundamental demographic information, including gender, age, teaching experience, country of residence, and educational qualifications. The second section of the study included a subjective norms scale consisting of 10 items. This scale aimed to measure the perceived social pressures and expectations from colleagues, educational institutions, and the wider TCFL community, based on Ajzen's (1991) framework. The content of sections three and four was influenced by Venkatesh et al. (2003). The following sections included scales measuring perceived ease of use and perceived usefulness, each consisting of 5 items. The perceived ease of use scale assessed teachers' perceptions of the effort required to implement blended teaching methodologies. The perceived usefulness scale was used to measure the perceived advantages of these methodologies in enhancing TCFL instruction (Sureshchandar, 2023). The fifth section introduced the Attitude Towards Blended Teaching scale, which is based on the TPB (Ajzen, 1991).

The purpose of this 5-item scale was to evaluate teachers' personal evaluations and sentiments towards the use of blended teaching approaches in TCFL. The sixth section of the study measures educators' readiness and plans to adopt blended teaching methodologies using a 5-item scale based on Ajzen's theoretical framework. The final section assessed the Adoption Behaviour of Blended Teaching in TCFL classrooms using a 5-item scale to measure the implementation and application of blended teaching practices. The questionnaire comprised two scales, one for perceived ease of use and one for perceived usefulness, with each scale containing 5 items. The study utilised the Perceived Ease of Use scale to assess the perceived effort required by teachers to implement blended teaching methods. Additionally, the Perceived Usefulness scale was used to measure the perceived benefits of these methods in TCFL instruction. The scales were designed to measure the frequency and extent of the application of blended teaching methodologies, as described in APPENDIX 1. Data gathering employed a 5-point Likert scale, extending from 1 (strongly disagree) to 5 (strongly agree), ensuring each scale's theoretical validity and relevance to the TCFL context.

The study employed several analytical techniques for data analysis, such as descriptive statistics, assessments of reliability and validity, confirmatory factor analysis, structural equation modelling, and path modelling. The study employed SPSS and Amos software to analyse data, aiming to understand the factors and processes that impact the adoption of TCFL based on the proposed model.

Results

Reliability Analysis

Table 2 displays a Cronbach's alpha coefficient of .949, calculated from a survey instrument containing 35 items, suggesting a high level of internal consistency. The coefficient surpasses the threshold for excellent reliability, indicating a strong correlation among the survey items and their effective measurement of the construct related to the adoption of blended teaching methods in TCFL (Peng & Fu, 2021). The high reliability coefficient of the instrument confirms its effectiveness in producing consistent and dependable outcomes across different applications, supporting its reliability for further analysis.

Table 2

Reliability Statistics

Cronbach's Alpha	N of Items
.949	35

Validity Test

The measurement tool's integrity was assessed using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, as shown in Table 3. The analytical procedures are crucial for assessing the suitability of the data for factor analysis, a necessary step in confirming the construct under investigation. The KMO Measure yielded a

value of .956, indicating data compatibility for factor analysis. The figure exceeds the benchmark of 0.9, indicating that the data is highly suitable for factor analytical procedures.

Table 3

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.956
	Approx. Chi-Square	10285.482
Bartlett's Test of Sphericity	df	595
	Sig.	.000

Structural Equation Model

Convergence Validity

Table 4 displays the factor loadings, Composite Reliability (CR), and Average Variance Extracted (AVE) for observed variables related to subjective norms, perceived usefulness, perceived ease of use, attitudes towards blended teaching, intention to use blended teaching, and the actual behavioural adoption of blended teaching in the TCFL framework. The internal consistency of the CR scores, which surpass the threshold of 0.7, confirms the reliability of the constructs within the model. Moreover, AVE values above the 0.5 benchmark confirm the construct validity of the model, suggesting that a significant proportion of the variation in the indicators can be attributed to their respective constructs. This analysis provides strong evidence for the model's convergent validity, indicating that the constructs are reliable and well-defined.

Discriminative Validity Analysis

The study on the adoption of blended teaching among instructors specialising in TCFL includes Table 5, which presents a matrix analysis of discriminative validity. This table compares the relationships between six latent variables in detail.

The analysis of the matrix shows that the diagonal elements, which represent the square root of the Average Variance Extracted (AVE), consistently exceed the off-diagonal elements in their respective rows and columns. The square root of the average variance extracted (AVE) for Subjective Norms is 0.762, which is higher than its correlations with constructs such as Perceived Usefulness (0.603) and Perceived Ease of Use (0.489). The consistent trend observed across all constructs meets the criteria for discriminant validity, indicating that each construct has a unique definition and represents different aspects of the phenomenon under investigation.

The analysis highlights a clear distinction between the constructs, confirming that each latent variable represents a unique aspect of the subject matter. The inclusion of this differentiation strengthens the conceptual framework of the study, thereby improving the integrity and interpretability of the model (Tay et al., 2022). The analysis significantly enhances the methodological robustness of the research by demonstrating both internal consistency and clear distinction among the constructs. Therefore, it enhances the reliability of the conclusions made regarding the factors that influence the adoption of blended teaching methods among TCFL educators.

Table 4

Convergence Validity

Latent Variables	Observation Indicators	Factor Loading	CR	AVE
Subjective norms	SN1	0.752		
	SN2	0.753		
	SN3	0.784		
	SN4	0.768		
	SN5	0.764	0.932	0.580
	SN6	0.757		
	SN7	0.764		
	SN8	0.753		
	SN9	0.754		
	SN10	0.762		
Perceived usefulness	PU1	0.742		
	PU2	0.778		
	PU3	0.741	0.862	0.555
	PU4	0.733		
	PU5	0.729		
Perceived ease of use	PE1	0.712		
	PE2	0.689		
	PE3	0.749	0.850	0.532
	PE4	0.786		
	PE5	0.706		
Attitudes towards blended teaching	AT1	0.743		
	AT2	0.745		
	AT3	0.725	0.863	0.558
	AT4	0.744		
	AT5	0.778		
Intention to use blended teaching	IT1	0.743		
	IT2	0.735		
	IT3	0.739	0.862	0.555
	IT4	0.732		
	IT5	0.776		
Adoption behavior of blended teaching among TCFL	AB1	0.736		
	AB2	0.701		
	AB3	0.800	0.858	0.547
	AB4	0.757		
	AB5	0.699		

Table 5

Distinguish Between Validity Tests

Latent variables	1	2	3	4	5	6
Subjective norms	**0.762**					
Perceived usefulness	0.603	**0.745**				
Perceived ease of use	0.489	0.556	**0.729**			
Attitudes towards blended teaching	0.585	0.548	0.588	**0.747**		
Intention to use blended teaching	0.557	0.558	0.551	0.555	**0.745**	
Adoption behavior of blended teaching among TCFL	0.533	0.592	0.464	0.526	0.550	**0.740**

Note: The diagonal is the square root of the corresponding dimension AVE

Assessment Framework and Fit Indices

The evaluation in Table 6 assesses the model's congruence with empirical data, specifically focusing on the adoption of blended teaching practices by TCFL instructors. The chi-square to degrees of freedom ratio (χ^2/df) is 1.217, which is significantly below the accepted maximum of 3. This indicates an optimal model fit. The Root Mean Square Error of Approximation (RMSEA) is 0.020, which is below the threshold of 0.08. This suggests a strong agreement between the model and the observed data. The Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI) are both above the recommended thresholds of 0.9 for GFI and 0.85 for AGFI, indicating a strong model fit. Specifically, the GFI is reported as 0.936 and the AGFI as 0.926. The Normed Fit Index (NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) all demonstrate strong support for the model's structural validity, with scores of 0.937, 0.987, and 0.988, respectively, exceeding the recommended threshold of 0.9. The indices collectively support the model's effectiveness in reflecting the theoretical constructs under investigation, while also emphasising its simplicity and superior fit compared to a null model.

The fit metrics collectively demonstrate that the measurement model strongly aligns with the empirical data, indicating that the model is both concise and meaningful. The comprehensive validation of the model's fit highlights the reliability and validity of the study's outcomes, providing a strong foundation for further analysis and interpretation of the adoption dynamics of blended teaching among TCFL professionals. Figure 1 illustrates the CFA.

Model Fit Metrics for the Structural Equation Model

Table 7 presents the assessment of the fit of the structural equation model using data on the adoption of blended teaching methods by TCFL educators. The chi-square to degrees of freedom ratio (χ^2/df) is 1.432, which is below the cutoff of 3. This indicates that the model is well-calibrated, balanced in complexity and parsimony, and avoids overfitting. The RMSEA of 0.028, which is significantly lower than the benchmark of 0.08, suggests a strong agreement between the estimated values of the model and the actual observations. The Goodness of Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI) exceed their critical values, with values of 0.926 and 0.915, respectively. This indicates that the model effectively captures the variance in the data. The AGFI, which considers model complexity, provides a more rigorous measure. The Normed Fit Index

(NFI), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI) yielded values of 0.925, 0.974, and 0.976, respectively, surpassing the established benchmarks. These results highlight the model's superiority over a baseline model and its ability to provide a concise and comprehensive representation of the data. The indices collectively demonstrate the structural equation model's ability and accuracy in reflecting empirical evidence, confirming its suitability for studying the adoption of blended teaching among TCFL educators.
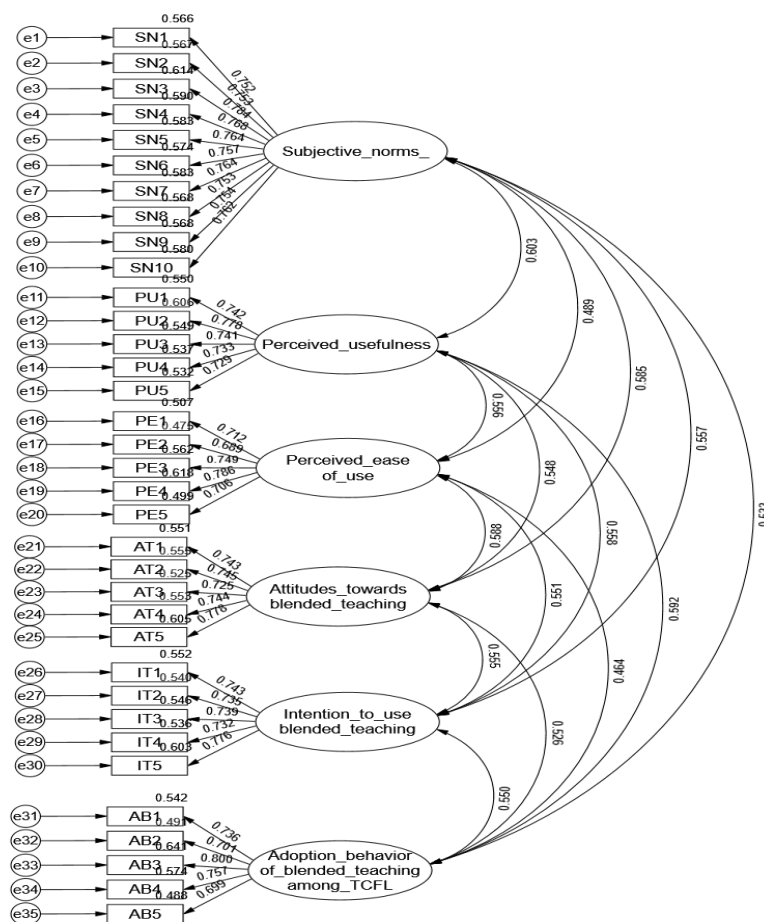

Figure 1: *Measurement Model.*

Table 6

Measure Model Fit Metrics.

Fit index	χ^2/df	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.85	>0.9	>0.9	>0.9
Result	1.217	0.020	0.936	0.926	0.937	0.987	0.988

Table 7

Model Fit Metrics

Fit index	χ2/df	RMSEA	GFI	AGFI	NFI	TLI	CFI
Reference standards	<3	<0.08	>0.9	>0.85	>0.9	>0.9	>0.9
Result	1.432	0.028	0.926	0.915	0.925	0.974	0.976

Path Analysis for Direct Effects

Table 8 examines the direct impacts observed in the adoption of blended teaching methods by TCFL educators. It explores the relationship between key theoretical constructs such as SN, PU, PE, AT, IT, and AB. The table's path analysis employs a comprehensive statistical approach to assess the proposed connections between these elements.

The evaluation utilizes standardized path coefficients (β), standard errors (S.E.), and critical ratios (C.R.), alongside p-values, to ascertain the significance of the proposed paths in the model. A C.R. value exceeding 1.96, paired with a p-value below 0.05, signifies statistical significance at a 95% confidence level. This approach forms the basis for confirming the hypothesized links, guaranteeing the empirical results' validity and reliability.

The findings support all the proposed hypotheses (H1-H7), indicating significant relationships among the constructs. The analysis demonstrates a strong relationship between PU and PE, as indicated by a high path coefficient and critical ratio. This emphasises the significant influence of PU on improving perceptions of PE. The relationship between the intention to use blended teaching and adoption behaviour is marked by strong path coefficients and significant critical ratios, highlighting the importance of user intention in the adoption process. The empirical findings provide support for the model, demonstrating the relationship between attitudes, subjective norms, PU, and PE in promoting the intention to adopt blended teaching methods, which is important for actual adoption behaviour. The findings support the model's validity and enhance our understanding of the factors influencing the adoption of blended teaching among TCFL educators. This study provides valuable evidence for designing interventions that promote the adoption of blended teaching practices in this educational context.

Table 8

Structural Equation Model Path Test

Hypothesis	Path	Estimate	β	S.E.	C.R.	P	Results
H1	AT→IT	0.199	0.208	0.054	3.698	***	Supported
H2	SN→IT	0.227	0.230	0.055	4.086	***	Supported
H3	PE→IT	0.191	0.195	0.053	3.566	***	Supported
H4	PU→IT	0.222	0.220	0.071	3.119	0.002	Supported
H5	PU→PE	0.625	0.605	0.057	10.918	***	Supported
H6	IT→AB	0.448	0.454	0.056	8.008	***	Supported
H7	PE→AB	0.228	0.236	0.051	4.478	***	Supported

Note: SN: Subjective norms; PU: Perceived usefulness; PE: Perceived ease of use; AT: Attitudes towards blended teaching; IT: Intention to use blended teaching; AB: Adoption behaviour of blended teaching among TCFL.
***: p<0.001

Path Analysis for Indirect Effects

Table 9 examines the mediation pathways involved in the adoption of blended teaching methods by TCFL teachers. This study utilises a non-parametric statistical approach known for its effectiveness in evaluating indirect effects. It examines the mediating roles of constructs including attitudes towards blended teaching, subjective norms, perceived ease of use, and perceived usefulness. The aforementioned factors demonstrate their influence on the intention to utilise blended teaching methods and their subsequent impact on adoption behaviour (Yu et al., 2023).

Table 9 displays effect sizes, standard errors (SE), and 95% bias-corrected confidence intervals (CI) for each hypothesised mediation path. This table provides a comprehensive assessment of the model's indirect relationships. The bias-corrected confidence intervals are important because they consider potential skewness in the sampling distribution, providing a more accurate estimation of the effect sizes.

The findings provide support for the indirect effects outlined in H8 through H13, indicating the presence of significant mediation pathways. The mediation effects of intention to use blended teaching on the relationships among attitudes towards blended teaching, subjective norms, perceived ease of use, perceived usefulness, and adoption behaviour have notable effect sizes. The importance of intention as a mediator between attitudes, norms, and perceptions, and actual adoption behaviour, is emphasised.

Furthermore, the path involving perceived usefulness to perceived ease of use to intention to use blended teaching and the extended mediation path from PU through PE to AB highlight the intricate interplay between PU and PE in fostering both the intention to adopt and the actual adoption of blended teaching methods.

The findings shed light on the intricate network of factors that contribute to the adoption of blended teaching practices among TCFL professionals. The study enhances our understanding of the mechanisms through which various factors contribute to the adoption of innovative teaching methodologies by elucidating the mediation roles of key constructs. It also provides crucial insights for crafting and executing strategies to encourage the adoption of blended teaching within this educational framework.

Table 9

Mediation Effect Bootstrap Test

Hypothesis	Mediation path	Effect size	SE	Bias-Corrected 95%CI		Results
H8	AT→IT→AB	0.089	0.039	0.018	0.172	Supported
H9	SN→IT→AB	0.101	0.042	0.029	0.198	Supported
H10	PE→IT→AB	0.085	0.037	0.015	0.167	Supported
H11	PU→IT→AB	0.100	0.047	0.020	0.223	Supported
H12	PU→PE→IT	0.119	0.052	0.016	0.224	Supported
H13	PU→PE→AB	0.142	0.049	0.060	0.251	Supported

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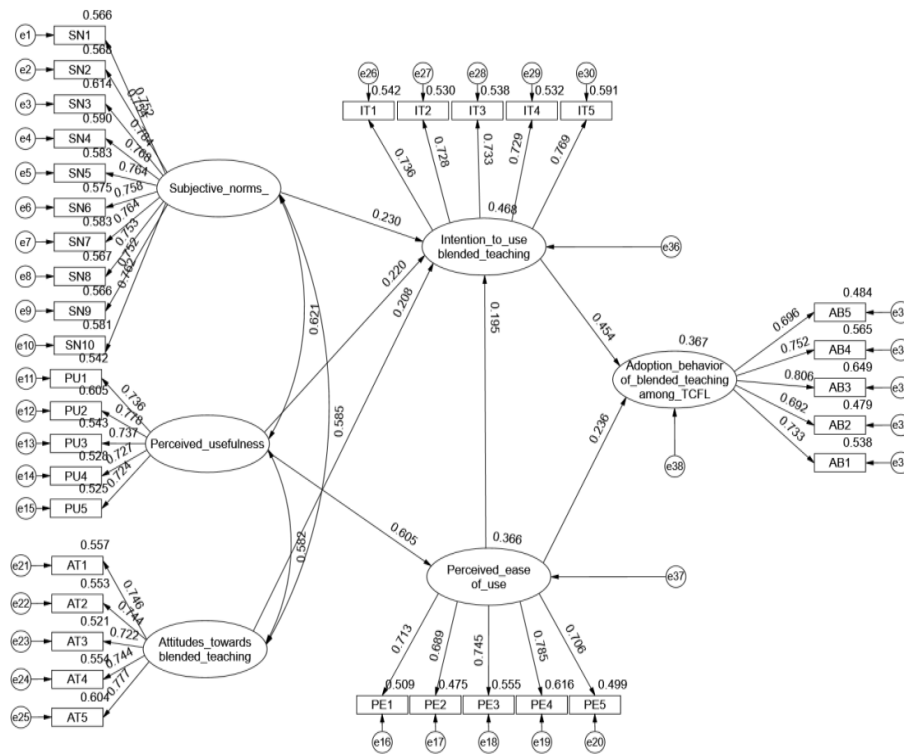
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Figure 2: *Structural Equation Model Path Diagram.*

Discussion and Conclusion

Major Finding

The results of H1-H7 provide a comprehensive understanding of the factors that influence the adoption of blended teaching methods in the field of Teaching Chinese as a Foreign Language (TCFL). The study findings indicate that positive attitudes towards blended teaching (AT) have a significant impact on teachers' intentions to use (IT) blended teaching methods, highlighting the importance of favourable perceptions and attitudes in the adoption process (Virani et al., 2023).

H2 through H7 provide insights into the various factors that affect the adoption of blended teaching among educators of Teaching Chinese as a Foreign Language. H2 emphasises the significance of subjective norms in influencing educators' intentions to adopt blended teaching. It underscores the impact of societal expectations and social influences on educators' decision-making process. The findings from H3 and 4 indicate that the perceived ease of use and usefulness significantly influence teachers' intentions to adopt blended teaching methods. Their significance within the context of technology acceptance theory is emphasised.

H5 demonstrates a strong correlation between perceived usefulness and ease of use, suggesting that the practical benefits of blended teaching methods contribute to their perceived ease of implementation. Hypotheses 6 and 7 suggest that the intention to use blended teaching and the perceived ease of use are important factors in determining actual adoption behaviour. This highlights the importance of both intention and perceived simplicity in real-world application. The findings illustrate the complex interplay between attitudes, societal influences, perceived benefits, and ease of use in promoting the adoption of blended teaching methods among professionals in the field of Teaching Chinese as a Foreign Language.

The examination of indirect effects through hypotheses H8 to H13 provides valuable insights into the intricate mechanisms that facilitate the implementation of blended teaching in the Teaching Chinese as a Foreign Language framework. The purpose of this study is to critically analyse the role of the intention to use blended teaching in connecting attitudes towards blended teaching, subjective norms, perceived ease of use, and perceived usefulness with actual adoption behaviour. The examination will take place from H8 to H11. The central role of IT as a channel for transforming instructors' perceptions and societal influences into adoption practices is highlighted by these hypotheses, which is supported by Zhang, King and Prior (2021). H12 and H13 examine the indirect effects of perceived usefulness on perceived ease of use, which in turn impact IT and AB. The PU's influence on adoption intentions and actions is mediated by its enhancement of PE, as explained by Bhujel and Joshi (2023) in their layered mediation framework. These investigations provide insight into the intricate dynamics that influence the adoption process, emphasising the significance of recognising both direct and indirect impacts to effectively encourage the integration of blended teaching strategies in the TCFL context.

Theoretical Implications

The integration of the Technology Acceptance Model and the Theory of Planned Behaviour (TPB) has been successfully utilised and confirmed in diverse educational fields, particularly in English as a Foreign Language (EFL) teaching. The application of this model to Teaching Chinese as a Foreign Language (TCFL) demonstrates its innovative deployment, emphasising its adaptability and applicability in various language teaching scenarios. The recurring motif in educational research emphasises the strength and flexibility of the model, validating its effectiveness in comprehensively understanding and improving language learning and instruction globally. Furthermore, previous studies have adeptly utilized this combined model to investigate the acceptance of blended learning systems. The results within the TCFL arena are in harmony with prior research, showcasing the integrated model's capability to elucidate the nuanced aspects of technological adoption in educational settings. Such uniformity underscores the model's precision in capturing the complexities of infusing technology into instructional practices within diverse linguistic educational frameworks.

The integrated model has been validated in the field of English language teaching (Tseng et al., 2022). However, its application to teaching Chinese as a Foreign Language is a new extension. The challenges and opportunities of teaching Chinese as a foreign language, including cultural and linguistic differences, require adaptations of the

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instructional model. This study demonstrates the model's adaptability and relevance in different educational settings, contributing to the academic discourse. Liu, Wang and Koehler (2019) identified barriers to ICT adoption in teaching Chinese as a Foreign Language that correspond to the factors of perceived ease of use and perceived usefulness in the Technology Acceptance Model.

This study provides a more detailed analysis of the obstacles, presenting strategies to address them through specific interventions that improve the perceived value and ease of adoption for teachers of TCFL.

The study's focus on subjective norms is consistent with the findings of Zhang et al. (2022), who emphasised the importance of system quality and social factors in the adoption of blended learning resources. They highlighted the need for a supportive social environment to facilitate the integration of blended teaching methods in Teaching Chinese as a Foreign Language. The focus on both the social and technical aspects of educational environments underscore the importance of actively creating an environment that supports the integration of blended teaching methods.

The intermediary function of the intention to use, bridging diverse factors with adoption behaviour, is corroborated by the study conducted by Uddin et al. (2020), which similarly recognized behavioural intentions as a pivotal mediator in the adoption mechanism. This highlights the importance of addressing both the attitudinal and the normative components to effectively promote blended teaching adoption.

This study contributes to the existing literature by offering empirical evidence of the applicability of the integrated TAM and TPB model in the TCFL context, which is a relatively underexplored area. The implementation of this model within the TCFL context offers valuable insights into the factors influencing the adoption of blended teaching among language educators. Additionally, this emphasises the necessity for additional research to investigate the cultural and contextual factors that may influence the components of the model in various educational environments (Shao, Pekrun, & Nicholson, 2019).

Implications to Practitioners

The study highlights the significant influence of attitudes towards blended teaching, subjective norms, perceived ease of use, and perceived usefulness on teachers' intentions to adopt blended teaching methodologies. The study found that the intention to use blended teaching is a strong predictor of its actual implementation. The results highlight the intricate relationship between cognitive, social, and technological factors in shaping the adoption of blended teaching practices among educators in the field of Teaching Chinese as a Foreign Language.

This study emphasises the importance of developing positive attitudes towards blended teaching and enhancing the perceived ease and usefulness of these methods for educators and practitioners in the field of Teaching Chinese as a Foreign Language. Educational institutions should prioritise professional development programmes that introduce TCFL teachers to blended teaching technologies and address pedagogical strategies for integrating these technologies into language instruction. Furthermore, establishing a supportive

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community that values and promotes innovative teaching practices can have a positive impact on subjective norms, thus encouraging greater adoption of blended teaching methods among teachers. The findings indicate that policymakers and educational leaders should implement policies that facilitate the provision of infrastructure and resources required for blended teaching, such as technology access and training. The recognition and rewarding of innovative teaching practices can enhance teachers' motivation to explore and adopt blended teaching methods.

There is a need for educational technology tools that are user-friendly, reliable, and pedagogically tailored to meet the unique requirements of Teaching Chinese as a Foreign Language (TCFL). Engaging teachers in the development and improvement process enhances the integration of technological solutions with the practical requirements of language instruction, thereby increasing their perceived value and usability. This research highlights the importance of engagement and feedback in improving blended teaching methodologies within the educational landscape that involves students and parents. Encouraging active participation and open communication regarding blended learning can enhance teaching methods, leading to more adaptable and effective approaches in Chinese language education.

Conclusion

This study enhances our understanding of the factors that affect the incorporation of blended teaching methods in the field of Teaching Chinese as a Foreign Language (TCFL). This study combines the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB) to examine the influence of attitudes, subjective norms, perceived ease of use, and perceived usefulness on the intentions and actions of educators in relation to blended teaching. The study examines the adoption process of TCFL educators in Southeast Asia, based on responses from 542 participants. It emphasises the importance of technological perceptions and social pressures in this process. The results support the use of the combined TAM and TPB framework in the TCFL setting and offer practical suggestions for teachers, educational leaders, technology developers, and the broader educational community to promote the adoption and successful implementation of blended teaching methods.

This study represents significant progress in understanding the adoption of blended teaching in the context of Teaching Chinese as a Foreign Language (TCFL). However, there are limitations due to the scope and methods used. The limited scope of the study in Southeast Asia may limit the generalizability of the findings, as variations in culture, education, and technology in other regions could yield different results. The use of purposive sampling, targeting a specific group of teachers, may not provide a comprehensive representation of the diverse range of perspectives and experiences among language educators. Furthermore, the theoretical framework utilized, while comprehensive, may not account for other influential factors on the adoption of blended teaching, including institutional support, individual innovativeness, or external obstacles related to technology usage. These considerations highlight the need for caution when applying the study's insights outside its immediate context and suggest areas for further research to build on these findings.

Therefore, it is imperative for future research to address these limitations and enhance our comprehension of the adoption of blended teaching in the context of Teaching Chinese as a Foreign Language. In order to achieve this objective, it is recommended that studies broaden their geographic scope and utilise random sampling methods to obtain a more comprehensive and representative understanding of the factors that influence the adoption of blended teaching. Furthermore, there is a need to further explore additional theoretical frameworks or incorporate new variables, such as technological self-efficacy or external constraints, to gain deeper insights into the dynamics of adoption. In addition, longitudinal investigations are warranted to elucidate the sustainability of blended teaching practices and their enduring impacts on teaching and learning outcomes over time. Additionally, employing qualitative research methods such as interviews and case studies could provide a valuable supplement to quantitative analysis, delivering in-depth and context-specific insights into the experiences and obstacles encountered by educators in adopting blended teaching strategies.

Overall, this study represents an initial effort to comprehend the implementation of blended teaching in the Chinese educational setting. It offers valuable insights into improving language education by integrating technology.

Data Availability Statement

The study's original contributions are documented within the article. For further questions, please contact the corresponding author.

Author Contributions

SJ, NT were responsible for conceptualization and drafting the original manuscript. SJ, KN, and NT conducted the formal literature search. SJ and NT designed the methodology. SJ, KN, and NT carried out the quality assessment. KN, EY, and NT were involved in reviewing and editing the draft. KN, EY, and NT also facilitated funding acquisition and oversaw project supervision. NT undertook the revision and proofreading tasks. All authors have read and consented to the published version of the manuscript.

Conflict of Interest

The authors affirm that the research was executed without any commercial or financial affiliations that might be interpreted as a potential conflict of interest.

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APPENDIX 1: Outline of questionnaire

Part 1. Information

Gender (Male, Female)
Age (<30; 30-35,35-40,40-45,45-50, >50)
Teaching experience (<1year, 1-3years, 3-5years, 5-10years, >10years)
Educational level (Bachelor, Master, Ph.D)

PART 2. Subjective norms

1. Most of my colleagues believe that using blended teaching methods is beneficial for TCFL.
2. The administration at my institution endorses the adoption of blended teaching methodologies in Teaching Chinese as a Foreign Language (TCFL).
3. Leading educators in TCFL often recommend the use of blended teaching.
4. My peers think that I should use blended teaching methods in my TCFL classes.
5. Experts in TCFL education advocate for the integration of technology and traditional methods.
6. The general trend in TCFL is moving towards more blended teaching approaches.
7. My students expect a mix of traditional and digital teaching methods in TCFL.
8. Educational policy makers in my region encourage blended teaching in language education.
9. There is a professional expectation in the TCFL community to keep up with modern teaching methods, including blended teaching.
10. Most TCFL training programs now include components on blended teaching methods.

PART 3. Perceived usefulness

1. Blended teaching methods enhance the effectiveness of my TCFL instruction.
2. Using blended teaching approaches helps me cover more course material efficiently in TCFL classes.
3. Blended teaching enhances engagement and interaction for my TCFL learners.
4. I find that blended teaching methods support diverse learning styles in my TCFL classroom.
5. Blended teaching approaches in TCFL make it easier for me to assess and track student progress.

PART 4. Perceived ease of use

1. I think blended teaching methods easy to integrate into my existing TCFL curriculum.
2. I believe that learning to use blended teaching tools and techniques is not difficult for TCFL teachers.
3. Blended teaching tools are user-friendly and easy to navigate for TCFL instruction.
4. I am confident in resolving basic issues with blended teaching in TCFL.
5. Adapting to blended teaching methods requires minimal effort for someone with my level of technical expertise in TCFL.

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PART 5. Attitudes towards blended teaching

1. I believe that blended teaching is an effective approach for TCFL.
2. Blended teaching methods make TCFL more interesting and engaging for both teachers and students.
3. I feel that blended teaching in TCFL enhances the learning experience beyond traditional methods.
4. I am enthusiastic about the potential of blended teaching to improve TCFL outcomes.
5. Incorporating blended teaching in TCFL aligns well with my teaching philosophy and style.

PART 6. Intention to use blended teaching

1. I intend to incorporate blended teaching methods in my TCFL classes in the near future.
2. I am actively seeking resources and training to improve my skills in blended teaching for TCFL.
3. I plan to regularly use blended teaching techniques in my TCFL curriculum.
4. I will recommend blended teaching approaches to my colleagues in the TCFL field.
5. In the next academic year, I aim to fully implement blended teaching strategies in my TCFL classes.

PART 7. Adoption behavior of blended teaching among TCFL

1. I regularly use a combination of online and traditional resources in my TCFL classes.
2. I've incorporated digital tools, such as educational apps and online platforms, into my TCFL teaching approach.
3. I often assign and review TCFL coursework that requires students to engage with both online and offline materials.
4. In my TCFL classes, I frequently use technology to facilitate interactive and collaborative learning activities.
5. I continuously seek feedback from my students to improve the blended teaching methods I use in TCFL.