University Teachers' Adoption of AI Writing Tools in Teaching English as a Foreign Language Academic Writing: Mixed Methods Research

Hongxia Hao [1], Abu Bakar Razali [2] *, Siti Nadhirah Abd Rahman [3]

[1] Universiti Putra Malaysia, Malaysia, 🆔 0009-0000-2832-3272
[2] Universiti Putra Malaysia, Malaysia, 🆔 0000-0002-3181-1004
[3] Universiti Putra Malaysia, Malaysia, 🆔 0000-0001-6552-6191
* Corresponding author: Abu Bakar Razali (abmr_bakar@upm.edu.my)

Article Info

Abstract

Although AI-powered writing tools (such as Grammarly, ProWritingAid, QuillBot, ChatGPT, and DeepSeek) are widely used in English academic writing and have brought new opportunities to teaching, their adoption by Chinese EFL university teachers is influenced by a variety of factors. Therefore, this study uses the Technology Acceptance Model 3 (TAM3) to explore the factors influencing the adoption of AI-powered writing tools by Chinese university teachers. This study used mixed methods research in which the researchers conducted a survey questionnaire on 240 English teachers from 12 public universities in China and selected 12 teachers for semi-structured interviews. The findings demonstrated that teachers' adoption of AI writing tools was significantly influenced by perceived usefulness, perceived ease of use, and external factors. Furthermore, perceived usefulness has a minor but significant influence on teachers' behavior intention, while perceived ease of use has the biggest influence, followed by external factors. This study is based on the TAM3, which is helpful in providing a theoretical framework to guide technology design and teaching practice, integrate educational technology policies, and provide a new empirical exploration model.

Introduction

With the rapid development of science and technology, artificial intelligence (AI) has flourished (Raj & Kos, 2023). AI tools are widely used in the field of education, especially in teaching English as a foreign language (EFL) (Pokrivčáková, 2019). The AI writing tools are based on large language models and can provide feedback on grammar, logic, organizational structure, etc. (Castellanos, 2023). AI writing tools play an important role in cultivating international talents with high-quality English writing skills. Therefore, China's Education Modernization 2035 explicitly states that universities must deeply integrate technologies, such as AI, with education to cultivate international talent (Jiang et al., 2022). However, English academic writing, as an important skill, has always been considered a difficult point for teachers. It is characterized by rigor and standardization, which poses a challenge to teachers' teaching (Ramzan et al., 2023). Teachers often face problems such as insufficient time and too many students, which makes it impossible to provide personalized feedback on students' writing (Ferris, 2011). Teachers often find it difficult to cover all dimensions of writing performance in their scoring criteria for academic writing, and different teachers have different understandings of good writing (Weigle, 2002). In addition, when students have a weak language foundation, such as insufficient vocabulary, weak grammar or limited reading comprehension, it is difficult for teachers to teach higher-level English academic writing skills (Aljohani, 2022). Many students find English academic writing boring and even resist it (Atasoy, 2021). Dealing with students' learning motivation issues when teaching writing skills is a significant challenge for educators.

AI writing tools are thought to be a major factor in the ongoing innovation and advancement of education (Tajik, 2025). Whether AI writing tools can be successfully incorporated into instruction depends on how many teachers use them. There are still many obstacles in the teaching and learning process, and EFL undergraduates view academic writing in English as one of the hardest skills to master (Hao & Razali, 2025). Chinese EFL undergraduates face challenges in grammar, vocabulary, structure, etc. in academic writing (Yu & Yan, 2024). In addition, the traditional teacher-centered writing teaching method cannot meet the needs of students' personalized learning and causes excessive feedback burden on teachers (He, 2021). Therefore, the use of AI writing tools can compensate for the drawbacks of conventional writing instruction and give students timely, individualized feedback to help them become more proficient writers and readers. But the use of AI writing tools has also generated a lot of debate. Students can now produce high-quality texts with ease thanks to AI writing tools, which may bring up moral concerns about bias, privacy, intellectual property, and academic integrity (Khatri & Karki, 2023; Giray, 2024). Over-reliance on AI tools may lead to students' lack of in-depth thinking during the writing process, thereby weakening their writing skills and causing their writing to lack critical thinking, originality, and innovation (Rizkiani et al., 2024). Teachers may have some concerns and problems when using AI tools to assist teaching in writing (Li, 2023). Therefore, teachers and students need to use AI tools moderately and reasonably to maximize their value.

Previous studies have shown that perceived usefulness, perceived ease of use, and external factors are considered important determinants of teachers' adoption of AI writing tools (Alrishan, 2023; Guo et al., 2024; Ghimire et al., 2024; Wang et al., 2021). Alrishan (2023) found that the practicality and usability of ChatGPT affect teachers'

use through a study of the behavioral willingness of EFL preparatory teachers in Oman to use AI tools. A study showed that teachers' behavioral intention was affected by their perception of the usefulness and ease of use of the tools (Guo et al., 2024). Teachers' acceptance of AI tools is also affected by external factors such as peer review and policy support (Ghimire et al., 2024). Teachers' perceived usefulness has a positive impact on their behavioral intention (Tekin, 2024). Perceived usefulness and perceived ease of use are considered to be important factors that can predict teachers' behavioral intention, and the determinant of behavioral intention is perceived ease of use (Wang et al., 2021). Based on the review of previous literature, the researchers found that most previous studies mainly used a single research method, namely structural equations, and mixed methods research based on this topic were extremely limited. There is currently a lack of research into the factors that influence Chinese university teachers' adoption of AI writing tools, and this study was conducted based on this.

In addition to offering motivation and insight for adoption of AI writing tools in practice, this current study is significant for enhancing related research. Additionally, this study is crucial for advancing the theory of teaching EFL. This study is crucial because it gives Chinese education policy makers and managers a solid scientific foundation on which to implement teaching reforms, define policies, and distribute educational resources in a logical manner. This study is helpful in supporting teachers to adopt AI teaching in English classroom. This study can not only meet the actual needs of Chinese English teachers and students, but also provide a reference for the development of AI writing tools. Based on TAM theory, the first question of this study aimed to broadly explore the factors influencing EFL university teachers' behavioral intention to adopt AI writing tools. The second question examined the influence of perceived usefulness (PU), perceived ease of use (PEU), and external factors on teachers' willingness to adopt AI writing tools. This provided an exploratory and theory-driven understanding of EFL teachers' technology adoption. The following are the study's research questions:

(1) What are the main technology acceptance model (TAM)-based factors considered in understanding Chinese university teachers' behavioral intention to adopt AI writing tools in EFL undergraduates' academic writing?

(2) How do perceived usefulness, perceived ease of use, and external factors influence Chinese university teachers' behavioral intention of adoption AI writing tools?

Literature Review

Artificial intelligence (AI) writing tools (such as ChatGPT and DeepSeek) are widely used in English writing instruction at universities. As a teaching aid, AI writing tools not only improve teachers' teaching efficiency but also enhance the accuracy of students' writing (e.g., vocabulary, grammar, and text). In addition, EFL academic writing instruction is complex and challenging for both teachers and students (Hyland, 2016). Students must master linguistic accuracy, critical thinking, and academic standards in English academic writing (Leki, 2010). Teachers teaching large classes of English academic writing face critical challenges such as untimely feedback and limited time (Zhang & Hyland, 2021). Therefore, AI writing tools are valuable in addressing academic writing challenges faced by both teachers and students. However, a solid theoretical framework is needed to determine whether Chinese EFL teachers are willing to adopt AI writing tools into their teaching practices and what factors influence their use.

In order to explain individuals' technology adoption behavior, Davis (1989) proposed the Technology Acceptance Model (TAM), the main purpose of which is to examine users' actual acceptance of technology and their willingness to use it (Al-Emran et al., 2018). In TAM, perceived usefulness (PU) and perceived ease of use (PEU) are two important factors that affect users' tendency to adopt technology. If teachers believe that the AI tools they use are useful and easy to use, they will actively use the technology (Davis, 1989; Teo et al., 2019). Their attitudes toward incorporating different technologies into teaching determine whether they will adopt these technologies (Hsieh & Tsai, 2017; Salleh, 2016). The Technology Adoption Model (TAM) is very simple and clear and has been continuously proven and practiced, which is an applicable and effective model in teaching and learning (Khanh & Gim, 2014). TAM can clearly explain teachers' intentions and behaviors in adopting technology in teaching activities (Scherer et al., 2019). The more familiar teachers are with technology, the less they pay attention to ease of use, which will affect their perception and attitude towards the ease of use of technology (Holzinger et al., 2011). With the development and advancement of technology, teachers are constantly exploring the integration of artificial intelligence (AI) writing tools into classroom teaching (Kinshuk et al., 2016; Hwang, 2014). TAM model is simple and applicable, and has good ability in explaining teachers' technology adoption behavior. Therefore, based on the TAM model, this study explores the factors that influence teachers' adoption of AI writing tools in writing instruction.

In the teaching and learning of EFL writing classroom, AI writing tools are being adopted (such as DeepSeek, ChatGPT). AI writing tools can provide learners with instant language correction, grammar checking, writing suggestions, and even in-depth text analysis. Previous studies have confirmed that perceived usefulness (PU), perceived ease of us (PEU), and external factors (EF) have a significant impact on teacher behavior. Alrishan (2023) conducted a structural equation model on 280 EFL preparatory teachers in Oman using a cross-sectional design and found that external factors can significantly affect EFL teachers' perceived usefulness (PU) and perceived ease of use (PEU) of ChatGPT as an AI tool. Guo et al. (2024) used a structural equation model to find that teachers' perceived usefulness, and perceived ease of use can significantly affect behavioral intentions. Ghimire et al. (2024) used a structural equation model and found through a study of college teachers that external factors (such as policy support and peer evaluation) can significantly affect teachers' acceptance of AI. Wu et al. (2023) also used a structural equation model to find that people's behavioral intention was more impacted by the ease of use of tools. Shofiah and Putera (2024) conducted a study on 10 teachers from three universities in Malang, Indonesia based on TAM and found that although the use of AI tools can bring them many benefits, there are also technical problems and feedback accuracy problems. Hu et al. (2025) conducted a a structural equation model on 563 pre-service teachers in China and found that teachers' behavioral intention to adopt AI tools was affected by effort expectancy, social influence, hedonic motivation and habit. Tekin (2024) used a structural equation model and found that teachers' perceived usefulness positively affected their behavioral intention. Wang et al. (2021) conducted a structural equation model on 311 college teachers and found that perceived usefulness and perceived ease of use had a positive impact on their behavioral intention to adopt AI writing tools, among which perceived ease of use was the determining factor of behavioral intention. However, Chou et al. (2024) conducted a structural equation model on 673 Taiwanese university teachers and found that teachers' willingness for innovation had a significant direct impact on their AI-supported behavior, with a good fit. Future use was significantly predicted by behavioral intention and facilitation conditions.

Overall, the studies showed that teachers' behavioral intentions to adopt AI writing tools was significantly affected by factors such as perceived utility, perceived ease of use, and external factors. This is crucial to promoting the effects of AI technology in higher education. Previous studies, such as Hu et al. (2025) and Shofiah & Putera (2024), have often used structural equation model (SEM) analysis on questionnaire surveys. However, these studies lack in-depth qualitative research to reveal detailed information. Therefore, current research on teachers' adoption of AI writing tools lacks a mixed-method research that comprehensively reveals patterns and combines in-depth narrative analysis. In addition, while there have been studies examining Chinese teachers' attitudes toward and influencing factors of AI tools (Guo et al., 2024; Hu et al., 2025; Wang et al., 2021), research on Chinese EFL university teachers' use of AI writing tools is currently limited. Furthermore, traditional writing instruction for Chinese university teachers faces challenges such as limited timelines, heavy workloads, significant variability, and long cycles. AI writing tools can, to a certain extent, effectively alleviate these challenges. Therefore, exploring Chinese EFL university teachers' adoption of AI writing tools holds both theoretical and practical significance. Moreover, research on teachers' behavioral intentions in using AI tools in English academic writing instruction is scarce. To fill the gaps in the above research, the researchers used an explanatory sequential mixed research (questionnaire and semi-structured interview) and took the technology acceptance model as the theoretical basis to explore the influencing factors of Chinese EFL universities' teachers' adoption of AI writing tools in English academic writing.

Research Methodology

Research Design

This study adopted mixed methods research with an explanatory sequential design, namely a survey questionnaire and semi-structured interview, to explore the factors that influence Chinese university teachers' adoption of AI writing tools for English academic writing instruction. Through a survey questionnaire, the researchers gathered quantitative data on the use of AI writing tools by 240 university instructors in China during the first phase. Using semi-structured interviews, the researchers examined the teachers' adoption attitudes and determinants of AI writing tool adoption in the second phase.

Research Participants

The researchers selected 240 English teachers from 12 public universities in China as the research participants through stratified random sampling and conducted a survey questionnaire. These teachers are diverse and different in terms of professional backgrounds, teaching experiences and professional titles. In order to explore the differences in the acceptance of AI writing tools by different types of university teachers, the researchers selected 240 teachers from 12 public universities in China, including 80 teachers from 4 985/211 universities (i.e., top international universities with more resources and stronger scientific research capabilities), 80 teachers from 4 ordinary universities (i.e., local universities that balance teaching and application), and 80 teachers from 4 higher vocational colleges (i.e., technology and application oriented). In addition, English academic writing course is offered in the third year of undergraduate studies and aims to improve the logic, fluency, rigor and academic standardization of students' writing. The selection criteria for these teachers are that they have more than one year

of teaching experience in English academic writing courses or related courses, they have used AI writing tools at least 10 times in EFL writing classes, and they voluntarily participate in this study and provide the most authentic feedback.

Table 1. Participant Information

University Type	University (N)	Teacher (N)	Total (N)
985/211 University	4	20	80
Ordinary University	4	20	80
Vocational University	4	20	80
Total	12		240

The researchers used stratified random sampling to select 12 teachers for semi-structured interviews (see Table 1). The selection criteria for these teachers are that all of them were teachers who taught English academic writing courses or guided English academic writing, they had all used AI writing tools for teaching, and they showed representative attitudes in the questionnaire. In order to ensure sample diversity, the researchers selected 12 teachers for semi-structured interviews based on three different university levels: 985/211 universities, ordinary universities, and vocational colleges, and the hierarchical structure of Chinese university teachers' professional titles, namely teaching assistant, lecturer, associate professor, and professor.

Data Collection

Survey questionnaires and semi-structured interviews were used to collect data to explore the factors that affect the adoption of AI writing tools by Chinese universities EFL teachers. The researchers communicated with the heads of 12 colleges through stratified sampling, and sent informed consent forms and survey questionnaire to 240 teachers via email. A total of 240 valid questionnaires were collected, with a questionnaire recovery rate of 100%. The online platform Wenjuxing was used to collect survey questionnaire from 240 teachers in 12 universities, and all teachers completed the answers within 30 minutes. The survey questionnaire is based on the technology acceptance model (TAM) and is adapted and revised from previous related studies according to the actual situation of this study (Davis, 1989; Teo et al., 2019). The survey questionnaire used a Likert five scale with a total of 16 questions (perceived usefulness, perceived ease of use, behavioral intention, and external factors). The researchers not only sent the survey questionnaire to three experts in the field for evaluation and modified it based on the results, but also conducted pilot the survey questionnaire before the study (n = 30). The Cronbach's α coefficient of each dimension was greater than 0.7, indicating good consistency (PU=0.81, PEU=0.82, BI=0.81, EF=0.80).

The researchers invited a total of 12 teachers to participate in the semi-structured interview and signed the informed consent form. Semi-structured online face-to-face interviews were used through Tencent Conference, with a total of 18 questions, and the interview time for each participant was about 30-40 minutes. he researchers sent the interview questions to three experts in the field for review and modified and adjusted them based on their comments. The interview included six dimensions, namely, perceived usefulness, perceived ease of use, external factors, the impact of perceived usefulness/perceived ease of use/external factors on behavioral intention. After

obtaining the consent of the teachers, the researchers recorded the interviews and transcribed them into text for further analysis. The two researchers took turns checking the transcribed texts to ensure the credibility and authenticity of the data.

Data Analysis

Descriptive statistics, factor analysis, regression analysis, and correlation analysis were used to analyze the survey questionnaire data. The researchers used factor analysis, regression analysis, and correlation analysis to explore the factors that affect teachers' application of AI writing tools (perceived usefulness, perceived ease of use, behavioral intention, and external factors). They also performed descriptive statistics on the basic information of teachers using SPSS statistical software. In addition, the researchers used thematic analysis and triangulation to analyze the content of semi-structured interviews. The researchers used Braun & Clarke's (2006) six-step thematic analysis method to process the semi-structured interview data. The researchers first read the transcribed interview texts repeatedly, and then generated initial codes based on recurring ideas, concepts, and statements. In order to guarantee the validity and dependability of the analysis, the researchers further refined the coded data according to the connections between each topic. Lastly, the researchers integrated the survey questionnaire and semi-structured interview data through triangulation to improve the stability and comprehensiveness of the conclusions.

Results

Research Question 1

Results of Survey Questionnaire

According to Table 2, the SD value of teachers' perceived usefulness (PU) is 1.27742, which is more dispersed than perceived ease of use (PEU) (.86880), external factors (EF) (.82321), and behavioral intention (BI) (.81478). In terms of Skewness, teachers' values on perceived usefulness (-.650), perceived ease of use (-.777), and behavioral intention (-.448) are negatively skewed, which means that most teachers have higher scores on these three items, while external factors is (.714), which means that most teachers have lower scores on external factors. The Kurtosis values of perceived ease of use (.815), external factors (.779), and behavioral intention (.204) are all greater than 0, which means that these data are more concentrated, while the data on perceived usefulness (-.718) are more dispersed.

Table 2. Descriptive Analysis

Variable	Mean	SD	Skewness	Kurtosis
PU	3.5533	1.27742	-.650	-.718
PEU	3.3000	.86880	-.777	.815
EX	2.1125	.82321	.714	.779
BI	3.1625	.81478	-.448	.204

According to the factor analysis results in Table 3, KMO is .752, and Bartlett's sphericity test $p < .001$, which demonstrated that factor analysis is appropriate for the variables. Furthermore, according to the first eigenvalues,

the first factor accounted for 87.701% of the variance, followed by the second at 7.618% and the third at 4.681%. After rotation, the values of the three factors were 35.226%, 35.053%, and 29.721%, respectively. This shows that the three factors explained the variation of the original data well and the factor structure was reasonable. Finally, perceived usefulness had the highest load (.777) on factor 1 (PU) and was mainly classified into factor 1, perceived ease of use had the highest load (.846) on factor 2 (PEU) and was classified into factor 2, and external factors had the highest load (.850) on factor 3 and was classified into factor 3. Therefore, there were three key factors that affect Chinese university teachers' adoption of AI writing tools, namely perceived usefulness, perceived ease of use, and external factors.

Table 3. Factor Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.					.752	
Sis.				<.001		
		Initial Eigenvalues		Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.631	87.701	87.701	1.057	35.226	35.226
2	.229	7.618	95.319	1.052	35.053	70.279
3	.140	4.681	100.000	.892	29.721	100.000
			Component			
		PU	PEU		EF	
PU		.777	.448		.443	
PEU		.371	.846		.383	
EF		.376	.369		.850	

The results based on factor analysis and descriptive statistics demonstrates that most teachers actively used AI writing tools, and they believes that perceived usefulness, perceived ease of use, and external factors were the three main determinants that influence whether they adopt these tools.

Results of Semi-Structured Interview

Perceived Usefulness (PU)

Semi-structured interviews with 12 Chinese university members regarding their perceived usefulness revealed that most faculty members believe AI writing tools contribute to various aspects of English academic writing instruction. They believe that AI writing tools help improve students' grammar, vocabulary, logic, fluency, and coherence. For example, teacher 1 noted: "AI writing tools can improve students' grammatical accuracy, vocabulary, and writing logic." Furthermore, most teachers believe that AI writing tools can improve their work efficiency, such as in lesson preparation, assignment grading, and academic writing. For example, teacher 8 noted: "AI writing tools help improve my efficiency in teaching." However, most teachers also expressed concerns about the potential for AI writing tools to raise academic integrity. For example, teacher 2 noted: "Over-reliance on AI writing tools may lead to academic integrity issues." It highlights the importance for Chinese university teachers of balancing the pedagogical benefits of using AI writing tools with academic ethics in English academic writing

instruction.

Perceived Ease of Use (PEU)

Most teachers believe AI writing tools are easy to use in teaching English academic writing, citing user-friendly interfaces, simple operations, and the provision of operation templates. This helps reduce the learning curve. For example, teacher 7 noted: "AI writing tools all have user-friendly interfaces and provide operation templates, which greatly reduces the learning curve." While most teachers find AI writing tools easy to use, they also express concerns about their accuracy, technical stability and dependency, and the cross-platform compatibility of educational versions. For example, teacher 10 noted: "While using AI writing tools in teaching, I've found issues such as inaccurate feedback, technical instability, and poor compatibility. I hope these issues can be properly addressed in the future." While AI writing tools are becoming increasingly popular, there is an urgent need for user-friendly AI writing tools that meet the teaching needs of Chinese university.

External Factors (EF)

Most teachers believe that universities lack clear and specific policies regarding the use of AI writing tools in English academic writing instruction. For example, teacher 11 noted: "My university doesn't have any specific policies regarding AI writing tools or related training." Furthermore, some universities have developed relevant policies and provided expert training to increase the adoption of AI writing tools. For example, teacher 5 noted: "My university has developed relevant policies and providing expert training." Most teachers believe that policy support, academic ethics, and peer review are key external factors influencing their use of AI writing tools. For example, teacher 7 noted: "Positive peer reviews strengthen my confidence in using AI writing tools. Proper use of AI writing tools ensures I adhere to academic ethics." It demonstrates the realities facing Chinese university teachers in integrating AI writing tools into English academic writing instruction, highlighting the urgent need for clearer policies, robust academic ethics guidelines, and supportive peer networks.

Based on results, perceived usefulness (PU), perceived ease of use (PEU) and external influence (EX) were the main factors affecting Chinese university teachers' adoption of AI writing tools in instruction.

Research Question 2
Results of Survey Questionnaire

According to the research results in Table 4, the correlation between PU and BI was .850, the correlation between PEU and BI was .888, and the correlation between EF and BI was .840, which indicated that PU, PEU and EF have a significant positive impact and correlation on their BI. The correlation between PU and PEU use was .841, and the correlation between PU and EF was .834, which further indicated that the relationship between PU, PUE, and EF was very close. Therefore, the correlation between the PU, PEU, EI, and BI variables was very high (r>0.5), which indicated that they played a key role in the process of teachers adoption of AI writing tools. The correlation between all variables was p < .001, which indicated that the correlation was statistically significant.

Table 4. Correlation Analysis

Variable	PU	PEU	EX	BI
PU	1	-	-	-
PEU	.841 (<.001)	1	-	-
EX	.834 (<.001)	.772 (<.001)	1	-
BI	.850 (<.001)	.888 (<.001)	.840 (<.001)	1

According to the results of regression analysis, PEU had the greatest impact on BI (β =.517, p < .001), which mean that most teachers believed that the PEU AI writing tools significantly enhanced their BI. EF also had a significant impact on BI (β =.309, p < .001), which mean that EF of teachers using AI writing tools affected their BI. PU had the smallest impact on BI (β = .158, p = .004), but it was significant, which mean that teachers believed that the usefulness of AI writing tools affected their adoption. All VIF values (PU=4.791, PEU=3.614, EF=3.4721) were less than 5, which mean that there was no serious multicollinearity problem in the model and the regression analysis results were robust.

Table 5. Regression Analysis

Variable	β	t	p	VIF
PU	.158	2.887	.004	4.791
PEU	.517	10.912	<.001	3.614
EX	.309	6.653	<.001	3.472

Based on the results of correlation and regression analysis, teachers' behavioral intention to adopt AI writing tools was highly significantly positively correlated with perceived usefulness, perceived ease of use and external factors (see Table 5). Perceived ease of use has the greatest impact on behavioral intention, followed by external factors and perceived usefulness.

Results of Semi-Structured Interview

Impact of Perceived Usefulness on Behavioral Intention

Most teachers believe that the usefulness of AI writing tools influences their behavioral intention. For example, teacher 4 noted: "Feedback from AI writing tools helps improve teaching efficiency and student learning outcomes." Furthermore, some teachers stated that even if AI writing tools are useful, they should be used reasonably and appropriately. For example, teacher 6 noted: "Teachers should use AI writing tools appropriately." Most teachers are willing to recommend AI writing tools to students, but they also emphasize the need for more comprehensive guidance on their use. For example, teacher 12 noted: "I would recommend these AI writing tools to students because they provide immediate and personalized feedback." However, teachers' willingness to adopt AI writing tools depends on the continued improvement of the tools' functionality and the provision of effective teaching support. For example, teacher 6noted: "If AI writing tools can provide more targeted, flexible, and professional feedback, I will be more proactive in using them." It indicates that Chinese university teachers have a positive attitude toward the impact of the usefulness of AI writing tools on their behavioral intentions in the

specific context of English academic writing instruction.

Impact of Perceived Ease of Use on Behavioral Intention

Most teachers indicated that their behavioral intention would be influenced if AI writing tools had an intuitive and concise interface, were easy to use, and had low equipment requirements. For example, teacher 11 noted: "If the interface and steps were simpler, I would be more willing to use AI writing tools." However, most teachers indicated that their behavioral intention would be reduced if the AI writing tools were complex to operate and had a high learning curve. For example, teacher 7 noted: "If the AI writing tool's operation was complex, it will cost more time to learn it, which will reduce my behavioral intention." Teachers also noted that despite receiving technical training, mastering all functions remained challenging and required ongoing learning. Therefore, usability factors such as user-friendliness and technical barriers to entry were important factors influencing teachers' behavioral intention. This finding suggests that user-friendliness and a low technical barrier to entry are key factors influencing Chinese university teachers' behavioral intention to adopt AI writing tools in English academic writing instruction.

Impact of External Factors on Behavioral Intention

Most teachers believe that academic ethics, school policies, and peer review are important external factors influencing their willingness to use AI writing tools. Most teachers believe that if the use of AI writing tools complies with school policies and the ethical standards of the education department, faculty members will be more willing to use them. For example, teacher 10 noted: "I will abide by the education department's ethical standards for the use of AI tools." Most teachers believe that if AI writing tools are incorporated into teaching requirements, they will cooperate, but they will also need to maintain critical thinking. For example, teacher 2 noted: "When AI writing tools are widely accepted by my peers and incorporated into teaching requirements, I am willing to adopt them." Finally, most teachers believe that if AI writing tools are recognized by the academic community, they will have greater confidence and willingness to use them. For example, teacher 8 noted: "If AI writing tools can be recognized by the academic community and meet teaching standards, I will cooperate and use them." It indicates that external factors such as academic ethics, school policies, and peer review play a key role in Chinese university teachers' willingness to adopt AI writing tools for academic writing instruction. Therefore, perceived ease of use, external factors, and perceived usefulness were predictors of teachers' behavioral intentions of adoption AI writing tools.

Discussion

This study explored the factors that influence Chinese university teachers' adoption of AI writing tools in English academic writing. The results of combining quantitative and qualitative data showed that perceived usefulness, perceived ease of use, and external factors significantly affect the behavioral intention of Chinese university teachers to adopt AI writing tools. Factor analysis showed that perceived usefulness, perceived ease of use, and external factors were the three main factors affecting their adoption. The highest factor loadings were perceived

usefulness (.777), perceived ease of use (.846), and external factors (.850). This study supported the results of Guo et al. (2024), teachers' perception of the usefulness and usability significantly affected their behavioral intention. This finding also supported the findings of Ghimire et al. (2024) through their study of teachers, that teachers' acceptance of AI is significantly affected by external factors. In addition, the results of the qualitative study also supported the results of the quantitative study. In addition to confirming its value in increasing teachers' efficiency in homework correction, scientific research writing, and textbook preparation, the majority of teachers thought AI writing tools improved students' writing in grammar, vocabulary, structure, and expression. Teachers were concerned, though, that students' chronic over-reliance on tools might compromise their academic integrity. This study was consistent with the results of Aljuaid (2024), who found that although AI helps with grammar and writing style, there were problems and controversies in terms of the innovation, originality, critical thinking, citation, argumentation and ethical standards of writing. Moreover, most teachers believed that AI writing tools had user-friendly interfaces and were easy to learn, but some of the functions were advanced, and there were problems such as academic accuracy, technology dependence and usability during use. The educational version functions, detailed explanations and cross-platform compatibility need to be improved. This study verified the results of Shofiah & Putera (2024), which studied 10 teachers from three universities in Malang, Indonesia and found that the use of AI tools can bring them many benefits, but there are also a series of problems, such as technical problems and feedback accuracy. Finally, the degree of policy support for AI writing tools in universities varies, and some universities didn't have clear policies yet. Factors such as academic ethics and peer evaluation significantly affected teachers' adoption (Ghimire et al., 2024).

The quantitative and qualitative data showed that perceived usefulness (PU), perceived ease of use (PEU) and external factors (EF) were positively correlated with teachers' behavioral intention to adopt AI writing tools. Perceived ease of use had the greatest impact on behavioral intention (β=.517, p<.001), which also showed that most teachers think that it was very easy to adopt AI writing tools and prefer tools that were simple to operate and have low requirements for device performance. This confirmed the study of Wang et al. (2021) that teachers' behavioral intention to adopt AI writing tools was affected by perceived usefulness and perceived ease of use, and perceived ease of use was the determinant of behavioral intention. In addition, behavioral intention was significantly affected by external factors (β=.309, p<.001), which showed that external factors (i.e., school policy support, positive peer evaluation, and tools that comply with academic ethics) could better promote teachers' behavioral intention to adopt AI writing tools. This result supported Alrishan (2023), who found that the behavioral intention of Omani English preparatory teachers to adopt ChatGPT AI writing tools was significantly affected by their perception of the practicality and usability of the tool. In addition, perceived usefulness had the smallest but significant effect on behavioral intention (β=.158, p=.004), indicating that teachers' perceived usefulness of AI writing tools affect their behavioral intentions. This finding was consistent with Wu et al. (2024), who found that although students were able to recognize the value of AI tools, their behavioral intentions were more influenced by the ease of use of the tools. These results were consistent with the feedback from teachers in actual interviews. When AI writing tools were powerful and quality assessments were further improved, most teachers were willing to apply them in future teaching. External factors such as academic and school policies would prompt teachers to adjust their usage methods, and the general acceptance of peers or scholars would also increase teachers' willingness to adopt them.

Conclusion, Implications and Recommendations

The researchers explored the factors that affect Chinese university teachers' adoption of AI writing tools for teaching from perceived usefulness, perceived ease of use, and external factors. The mixed research results showed that perceived usefulness, perceived ease of use, and external factors were the main factors affecting teachers' adoption of AI writing tools. Teachers' behavioral intentions are significantly positively correlated with perceived usefulness, perceived ease of use, and external factors. Perceived ease of use had the greatest impact on behavioral intentions, followed by external factors, and perceived usefulness had a smaller but significant impact. This showed that teachers' behavioral intentions to adopt AI writing tools were affected by perceived usefulness, perceived ease of use, and external factors.

This study can provide valuable insights for policymakers to formulate evidence-based and practical policies. University academic affairs offices and curriculum committees should formulate clear and specific policies, such as guidelines for the use of AI writing tools, academic ethics standards, and teacher and student training programs, to reduce the dependence of teachers and students on AI writing tools. University academic affairs offices and curriculum committees should not only formulate comprehensive, transparent, inclusive, and forward-looking adaptive policies. Clear academic integrity guidelines to prevent over-reliance, and a sound monitoring and evaluation mechanism should be established. In addition, this study is of great significance in providing improvement directions for developers of AI writing tools. For example, developers can enhance cross-platform compatibility, make academic feedback more professional, and simplify the operating interface of AI writing tools. Moreover, this study gives teachers ideas for increasing their productivity and teaching students how to properly use AI writing tools. It provides valuable insights for improving teacher teaching effectiveness, promoting professional development, and experimenting with new teaching models. In addition to adding to the empirical research on AI writing tools in language instruction, this study is significant because it offers a theoretical framework for further investigation.

Colleges and universities should actively organize training activities for AI writing tools and establish a sound academic integrity supervision mechanism to improve teachers' ability to apply and manage AI writing tools. They should actively formulate clear academic norms and methods for handling violations to guide teachers and students to establish correct academic ethics. In addition to expanding the scope of research participants, such as covering teachers from different disciplines and regions, future research can also explore students' views on AI writing tools and the long-term teaching significance of AI writing tools. Future studies can compare the opinions of teachers and students and incorporate the opinions of students regarding AI writing tools.

References

Al-Emran, M., Mezhuyev, V., & Kamaludin, A. (2018). Technology Acceptance Model in M-learning context: A systematic review. *Computers & Education, 125,* 389-412. https://doi.org/10.1016/j.compedu.2018.06.008

Aljohani, N. J. (2022). Longitudinal study of a procedure for training low-proficiency english language students.

Asian-Pacific Journal of Second and Foreign Language Education, 7(1), 27. https://doi.org/10.1186/s40862-022-00154-5

Aljuaid, H. (2024). The impact of artificial intelligence tools on academic writing instruction in higher education: A systematic review. *Arab World English Journal (AWEJ) Special Issue on ChatGPT.* https://ssrn.com/abstract=4814342

Alrishan, A. M. H. (2023). Determinants of intention to use ChatGPT for professional development among Omani EFL pre-service teachers. International Journal of Learning, *Teaching and Educational Research,* 22(12), 187-209. https://doi.org/10.26803/ijlter.22.12.10

Atasoy, A. (2021). The Relationship Between Writing Self-Efficacy and Writing Skill: A Meta-Analysis Study. *Education & Science/Egitim ve Bilim, 46*(208). DOI: 10.15390/EB.2021.10024

Castellanos-Gomez, A. (2023). Good practices for scientific article writing with ChatGPT and other artificial intelligence language models. *Nanomanufacturing, 3*(2), 135-138. https://doi.org/10.3390/nanomanufacturing3020009

Chou, C. M., Shen, T. C., Shen, T. C., & Shen, C. H. (2024). Teachers' adoption of AI-supported teaching behavior and its influencing factors: Using structural equation modeling. *Journal of Computers in Education,* 1-44. https://doi.org/10.1007/s40692-024-00332-z

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly,* 319-340. https://doi.org/10.2307/249008

Ferris, D. (2011). *Treatment of error in second language student writing.* University of Michigan Press.

Ghimire, A., Pather, J., & Edwards, J. (2024, October). Generative AI in education: A study of Educators' awareness, sentiments, and influencing factors. *In 2024 IEEE Frontiers in Education Conference (FIE)* (pp. 1-9). IEEE. https://doi.org/10.1109/FIE61694.2024.10892891

Giray, O. (2024). Contributions of Intelligence Agencies to Türkiye's Security. *BRIQ Belt & Road Initiative Quarterly, 6*(1), 74-91. https://nbn-resolving.org/urn:nbn:de:0168-ssoar-98640-6

Guo, S., Shi, L., & Zhai, X. (2024). Validating an Instrument for Teachers' Acceptance of Artificial Intelligence in Education. *arXiv preprint arXiv*:2406.10506. https://doi.org/10.48550/arXiv.2406.10506

Hao, H. X., & Razali, A. B. (2025). Impact of ChatGPT on English academic writing ability and engagement of Chinese EFL undergraduates. *International Journal of Instruction, 18*(2), 323-346. https://doi.org/10.29333/iji.2025.18218a

He, Y. (2021, May). *Analysis on the comparison between Chinese and Western classroom teaching. In 7th International Conference on Humanities and Social Science Research (ICHSSR 2021)* (pp. 63-66). Atlantis Press. https://doi.org/10.2991/assehr.k.210519.012

Holzinger, A., Searle, G., & Wernbacher, M. (2011). The effect of previous exposure to technology on acceptance and its importance in usability and accessibility engineering. *Universal Access in the Information Society, 10,* 245-260. https://doi.org/10.1007/s10209-010-0212-x

Hsieh, W. M., & Tsai, C. C. (2017). Taiwanese high school teachers' conceptions of mobile learning. *Computers & Education, 115,* 82-95. https://doi.org/10.1016/j.compedu.2017.07.013

Hu, L., Wang, H., & Xin, Y. (2025). Factors influencing Chinese pre-service teachers' adoption of generative AI in teaching: an empirical study based on UTAUT2 and PLS-SEM. *Education and Information Technologies,* 1-23. https://doi.org/10.1007/s10639-025-13353-7

Hwang, G. J. (2014). Definition, framework and research issues of smart learning environments-a context-aware ubiquitous learning perspective. *Smart Learning Environments, 1,* 1-14. https://doi.org/10.1186/s40561-014-0004-5

Jiang, Y., Zhang, B., Zhao, Y., & Zheng, C. (2022). China's preschool education toward 2035: Views of key policy experts. *Ecnu review of education, 5*(2), 345-367. https://doi.org/10.1177/20965311211012705

Khanh, N. T. V., & Gim, G. (2014). Factors influencing mobile-learning adoption intention: An empirical investigation in high education. *Journal of Social Sciences, 10*(2), 51-62. http://www.thescipub.com/jss.toc

Khatri, B. B., & Karki, P. D. (2023). Artificial intelligence (AI) in higher education: Growing academic integrity and ethical concerns. *Nepalese Journal of Development and Rural Studies, 20*(01), 1-7. https://doi.org/10.3126/njdrs.v20i01.64134

Kinshuk, Chen, N. S., Cheng, I. L., & Chew, S. W. (2016). Evolution is not enough: Revolutionizing current learning environments to smart learning environments. *International Journal of Artificial Intelligence in Education, 26*(2), 561-581. https://doi.org/10.1007/s40593-016-0108-x

Li, H. (2023). AI in education: Bridging the divide or widening the gap? Exploring equity, opportunities, and challenges in the digital age. Advances in Education, *Humanities and Social Science Research, 8*(1), 355-355. https://doi.org/10.56028/aehssr.8.1.355.2023

Raj, R., & Kos, A. (2023). Artificial Intelligence: Evolution, Developments, Applications, and Future Scope. *Przeglad Elektrotechniczny, 99*(2). DOI: 10.15199/48.2023.02.01

Rizkiani, S., Maulana, A., Resmini, S., & Satriani, I. (2024). EXAMINING THE USE OF AI TOOLS IN ACADEMIC WRITING: EFFECTS ON THE CRITICAL THINKING SKILLS OF EFL LEARNERS. *JELA (Journal of English Language Teaching, Literature and Applied Linguistics), 6*(2), 111-121. https://doi.org/10.37742/jela.v6i2.155

Salleh, S. (2016). Examining the influence of teachers' beliefs towards technology integration in classroom. *The International Journal of Information and Learning Technology, 33*(1), 17-35. https://doi.org/10.1108/IJILT-10-2015-0032

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers & education, 128,* 13-35. https://doi.org/10.1016/j.compedu.2018.09.009

Shofiah, N., & Putera, Z. F. (2024). *Examining the user experience of artificial intelligence tools in academic writing: The perceptions lecturers practices.* https://doi.org/10.21203/rs.3.rs-3871916/v1

Tajik, A. (2025). *Exploring the role of AI-driven dynamic writing platforms in improving EFL learners' writing skills and fostering their motivation.* https://doi.org/10.21203/rs.3.rs-5788599/v1

Tekin, Ö. G. (2024). Factors affecting teachers' acceptance of artificial intelligence technologies: Analyzing teacher perspectives with structural equation modeling. *Instructional Technology and Lifelong Learning, 5*(2), 399-420. https://doi.org/10.52911/itall.1532218

Teo, T., Sang, G., Mei, B., & Hoi, C. K. W. (2019). Investigating pre-service teachers' acceptance of Web 2.0 technologies in their future teaching: a Chinese perspective. *Interactive Learning Environments, 27*(4), 530-546. https://doi.org/10.1080/10494820.2018.1489290

Wang, Y., Liu, C., & Tu, Y. F. (2021). Factors affecting the adoption of AI-based applications in higher education.

Educational Technology & Society, 24(3), 116-129. https://www.jstor.org/stable/27032860

Weigle, S. C. (2002). *Assessing writing.* Cambridge University Press.

Wu, H., Wang, Y., & Wang, Y. (2024). "To Use or Not to Use?" A mixed-methods study on the determinants of EFL college learners' behavioral intention to use AI in the distributed learning context. *International Review of Research in Open and Distributed Learning, 25*(3), 158-178. https://doi.org/10.19173/irrodl.v25i3.7708

Yu, H., & Yan, P. (2024). The Academic Writing Challenges of Undergraduate Students: An Exploratory Study at a Sino-Foreign University in China. *In English for Academic Purposes in the EMI Context in Asia: XJTLU Impact* (pp. 15-43). Cham: Springer Nature Switzerland. https://doi.org/10.29333/iji.2025.18218a