

Original Paper

A Study on the Impact of AI-Assisted Teaching Integration in College English on Students' Writing Performance: A Case Study of Hubei Polytechnic University

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Abstract

At present, there are some problems in college English writing teaching, such as students' low interest in writing, lack of personalized guidance, and low feedback efficiency. Artificial intelligence technology provides new ideas for teaching reform. In order to explore the actual impact of artificial intelligence-assisted teaching on college students' English writing ability, this study selected two non-English major classes in Hubei Polytechnic University to carry out a one-semester quasi-experiment: 55 students in the experimental group adopted artificial intelligence-assisted teaching, and 53 students in the control group adopted traditional teaching. After the experiment, data were collected through questionnaires and in-depth interviews (10 students in each group), and the teaching effectiveness was evaluated by combining quantitative and qualitative results. The results showed that the average scores of each dimension of writing ability in the experimental class were higher than those in the control group, but did not reach a statistically significant level ($P > 0.05$). In the interview, the students in the experimental class had a significantly higher positive evaluation of writing interest (80%), learning effect (70%) and classroom interaction (90%). At the same time, they also put forward the problems of imperfect AI tools and easy to produce technical dependence. The control group feedback that the traditional teaching has the shortcomings of feedback lag and single form. In summary, although there is no significant statistical difference in the quantitative data, the mean value shows a positive trend of AI-assisted teaching, and the interview results also confirm that it can stimulate writing interest and improve learning experience. The teaching mode has application potential, and the teaching effect can be improved by prolonging the intervention cycle, optimizing the tools and strengthening the guidance of teachers.

Keywords

AI-assisted teaching, College English writing, Writing ability

1. Introduction*1.1 Background of the Study*

College English writing is the core component of College English teaching. It is not only the key index to measure students' comprehensive language application ability, but also an important carrier to cultivate students' logical thinking, cultural awareness and intercultural communication ability. Under the background of the high-quality development of higher education and the deepening reform of College English teaching, improving students' English writing ability and optimizing the teaching effect of writing have become an important task of College English teaching. However, the current college English writing teaching still faces many practical difficulties, which is difficult to fully meet the dual needs of students' ability development and teaching reform.

From the perspective of students, there are many problems in college students' English writing, such as lack of motivation, weak willingness to practice actively, and lack of continuity in extracurricular writing practice; At the same time, students are generally weak in vocabulary use, grammatical accuracy, text structure and logical expression, and the standardization and appropriateness of language output need to be improved. From the perspective of teaching, the non-AI-assisted writing teaching has long been limited by the single teaching mode, low feedback efficiency and lack of personalized guidance. In the large class teaching environment, it is difficult for teachers to carry out real-time tracking and precise guidance for each student's writing process, and writing correction and feedback are often lagging behind, which is difficult to meet the learning needs of students' immediate correction and continuous improvement. The above problems restrict the improvement of College English writing teaching quality, and also highlight the urgency of innovating teaching mode and introducing intelligent teaching methods.

In recent years, the rapid popularization and in-depth application of artificial intelligence technology in the field of education has provided new ideas and technical support for solving the problems of non-AI-assisted writing teaching. Artificial intelligence has the functions of personalized resource push, real-time grammar error correction, multi-dimensional writing evaluation, interactive learning guidance and so on. It can effectively make up for the shortcomings of non-AI-assisted writing teaching in efficiency, accuracy and personalization, and is highly consistent with the reform needs of College English writing teaching. Integrating AI assisted instruction into College English writing classroom can not only enrich teaching resources and optimize the feedback mechanism, but also stimulate students' interest in writing, improve their autonomous learning ability, and promote the transformation of writing teaching from "teacher led" to "human-computer cooperation and student-centered".

In this context, it is of great practical significance and research value to systematically explore the actual effect of the integration of AI assisted instruction in College English writing teaching and

analyze its influence mechanism on students' writing ability. Based on the actual situation of College English Teaching in local colleges and universities, this study takes this as the starting point to carry out empirical research, in order to provide practical basis and reference path for the deep integration of artificial intelligence and College English writing teaching.

1.2 Purpose and Significance of the Study

1.2.1 Purpose of the Study

Under the guidance of connectivism learning theory and constructivism learning theory, this study focuses on the practical path of AI technology enabling College English writing teaching. At present, there are still many problems in College English writing teaching, such as the single teaching mode, the lack of students' writing motivation, and the lack of personalized feedback, which restrict the comprehensive improvement of students' writing ability and comprehensive quality. Constructivism emphasizes the significance of students' active knowledge construction in the real situation, while connectionism focuses on the connecting role of technology in the construction of learning network. Therefore, this study takes non-English majors in Hubei Polytechnic University as the research object, and adopts the college English writing teaching mode assisted by artificial intelligence technology. The purpose of this study is to analyze the difference between this mode and the non-artificial intelligence assisted teaching mode in improving students' writing skills, as well as the potential advantages of artificial intelligence assisted teaching in efficiency, so as to provide empirical basis and practical reference for the reform of college English writing education.

1.2.2 Significance of the Study

(1) theoretical significance:

This study takes George Simmons' connectionist learning theory and constructivist learning theory as the binary framework. Connectivism regards learning as a process of 'establishing connections' and 'navigating information' in a dynamic network, while constructivism emphasizes the importance of learners' active construction of knowledge meaning in their interaction with the environment. In this compound perspective, AI tools (such as writing aids and large language models) are not only the crucial external cognitive nodes in students' personal learning network, but also the intelligent scaffolding to support students' meaning construction. Therefore, the theoretical significance of this study is that it redefines AI assisted writing learning from the "knowledge internalization" paradigm as the process of students' active meaning construction supported by AI tools, and its ability to build a human-computer collaborative writing network with AI tools, information resources and learning communities, thus deepening and enriching the theoretical Research on writing teaching in the digital era.

(2) Practical significance:

At the practical level, this study provides practical cases for College English teaching by constructing and implementing AI assisted English writing teaching mode. For teachers, this model helps to promote the diversification and accuracy of teaching methods, and improve their ability of information-based

teaching design and implementation. For students, the real-time interaction and personalized feedback of AI can enhance the interest and sense of participation in the writing process, stimulate learning initiative, and promote the development of autonomous writing ability and comprehensive language use ability. This study is in line with the direction of College English teaching reform, and aims to provide an operable practical path for promoting the high-quality development of English writing teaching.

2. Method

2.1 Research Questions

In order to systematically explore the practical impact of AI assisted instruction on College English Writing Teaching on students' writing ability, this study focuses on the following four core issues:

After a semester of teaching experiment, can AI assisted writing teaching significantly improve students' English writing ability compared with non-AI-assisted teaching? Are there significant differences in the four core dimensions of learning ability, language ability, thinking quality and cultural awareness?

What are students' acceptance, subjective experience and satisfaction with AI Assisted College English writing teaching? What are the advantages and disadvantages of this mode compared with Non-AI-assisted teaching?

Combined with the empirical results and students' feedback, how to optimize the application path of AI assisted instruction in College English writing, so as to better meet the students' learning needs and improve the teaching effect?

2.2 Research Subjects

This study selects two college English teaching classes under the course selection system of Hubei Polytechnic University. After excluding the students who did not complete the questionnaire survey, 55 students in the experimental class (AI assisted teaching) and 53 Students in the control class (Non-AI-assisted teaching) were determined. The two classes of students are lower-division undergraduate students, who have not been systematically exposed to AI assisted English writing teaching, and meet the requirements for the selection of experimental subjects. The basic information distribution of the research object is shown in Table 1 and Table 2.

Table 1. Basic Information Distribution of Research Subjects in the Experimental Class (N=55)

Demographic Characteristics	Options	Subtotal	Proportion (%)
Gender	Male	26	47.27
	Female	29	52.73
Major	Arts	7	12.73
	Science	48	87.27

Table 2. Basic Information Distribution of Research Subjects in the Control Class (N=53)

Demographic Characteristics	Options	Subtotal	Proportion (%)
Gender	Male	33	62.26
	Female	20	37.74
Major	Arts	21	39.62
	Science	32	60.38

There are a total of 55 students in the experimental class (AI assisted teaching), including 26 male students (47.27%) and 29 female students (52.73%), with a balanced gender ratio; In terms of professional distribution, there are 7 humanities students (accounting for 12.73%) and 48 science students (accounting for 87.27%), with science students being the main group.

There are a total of 53 students in the control class (Non-AI-assisted teaching), including 33 boys (62.26%) and 20 girls (37.74%), with a slightly higher proportion of boys; In terms of professional distribution, there are 21 humanities students (39.62%) and 32 science students (60.38%), with science students being the majority. However, the proportion of humanities students is significantly higher than that of the experimental class.

On the whole, the number of male and female students in the experimental class is basically the same, mainly composed of science students; the number of boys in the control class is slightly more than that of girls, and the proportion of science students is significantly higher than that of liberal arts students.

2.3 Research Instruments

2.3.1 Questionnaire

The study adopted the “Practical Writing Status Questionnaire for High School Students in English” written by Tong Xiaoxi (2025), and after necessary adjustments, it was distributed and used as a measurement tool. There are 28 questions in the questionnaire. The evaluation of writing ability is designed from five aspects: learning ability, language ability, thinking quality, cultural awareness, and Teaching Model Evaluation. The distribution of questions is shown in Table 3. The questionnaire adopts a Likert five points rating system, with 1 point for “completely disagree” and 5 points for “very agree”. The higher the score, the better the student’s ability performance in that dimension and the higher their recognition of the teaching mode. After testing, the Cronbach’s alpha coefficient of the questionnaire is 0.86, indicating good reliability and validity. A total of 141 questionnaires were distributed to the experimental group (73 people) and the control group (68 people) in this study, and 108 were actually collected, with a questionnaire collection rate of 76.6%. In the collected questionnaires, all questionnaires were filled out completely, with 108 valid questionnaires. 33 students who did not participate in the survey were absent due to reasons and were unable to complete the questionnaire.

Table 3. Questionnaire Dimensions and Corresponding Question Distribution

Questionnaire Dimensions	Corresponding Question Numbers	Number of Questions
Learning Ability	1、3、5、6、7、8	6
Language Proficiency	9、10、11、12、13、14、15、16	8
Thinking Quality	17、22、23、24、25、26	6
Cultural Awareness	18、19、20、21	4
Teaching Model Evaluation	27、28	2

2.3.2 Interview

This study adopts the semi-structured offline one-to-one interview method, and randomly selects 10 students from the experimental class and the control class as the interviewees. The sampling strictly follows the principles of gender balance, professional coverage and writing level stratification, so as to ensure the representativeness and comparative validity of the interview results.

The interviews in the experimental class centered on AI assisted English writing teaching, and the control class replaced “Ai assisted English writing teaching” with “Non-AI-assisted writing teaching” to ensure that the two classes’ interview questions had the same structure, the same dimensions and were strictly comparable. The interview outlines of the two classes contain five core questions, as shown in Table 4.

Table 4. Sampling Details of Interviewees

Category	Subcategory	Experimental Class	Control Class
Gender	Male	5	5
	Female	5	5
Major	Arts	3	3
	Science	7	7
Writing Level (based on pre-test scores)	High (top 27%)	2	2
	Medium (middle 46%)	6	6
	Low (bottom 27%)	2	2

Based on the core research questions of this study, the interview outline directly corresponds to the five dimensions of “learning interest, learning effect, teaching mode difference, teaching help, deficiency and suggestions”. At the same time, it closely follows the whole process of writing teaching, forming a complete logical chain. The problem design is concise and clear, and the guiding expression is avoided to ensure the authenticity and reliability of the interview data, which is convenient for the subsequent classification and comparative analysis, and can effectively obtain the students’ subjective attitude, real experience and improvement suggestions. During the interview, the researcher recorded the key

information on the spot, and then transcribed, sorted out and analyzed the theme, so as to compare the subjective differences between the two classes in terms of writing interest, learning effect and teaching experience, and provide qualitative support for the research conclusion.

Table 5. Interview Outlines for the Experimental Class and the Control Class

Interview Questions for the Experimental Class	Interview Questions for the Control Class
1. Do you think AI-assisted College English writing teaching has improved your interest in English writing? In what specific aspects?	1. Do you think this semester's College English writing teaching has improved your interest in English writing? In what specific aspects?
2. How do you think the learning effect of AI-assisted writing is, and has it helped your grades?	2. How do you think the learning effect of English writing this semester is, and has it helped your grades?
3. What are the differences between AI-assisted English writing classes and Non-AI-assisted English writing classes? Please give examples.	3. What are the characteristics of this semester's English writing classes in terms of teaching forms and teaching content? Please give examples.
4. Has this semester's AI-assisted writing teaching been helpful to your English writing? If yes, please explain in detail.	4. Has this semester's English writing teaching been helpful to your English writing? If yes, please explain in detail.
5. What are the shortcomings of this semester's AI-assisted writing teaching practice? What suggestions do you have?	5. What are the shortcomings of this semester's English writing teaching practice? What suggestions do you have?

2.4 Research Procedures

2.4.1 Experimental Preparation Stage

First of all, fully communicate with the teachers involved in the experiment, explain the purpose and overall design of the teaching experiment in detail, including the setting of the experimental class and the control class, the arrangement of the experimental cycle, and clarify the roles and specific tasks of the teachers in the experimental process. On this basis, the specific teaching methods, teaching processes and expected teaching effects of AI-assisted and non-AI-assisted modes in college English writing teaching are discussed together to ensure that teachers have a clear understanding of the experimental program and reach a consensus.

Secondly, two appropriate natural classes are selected as the experimental class and the control class respectively. When determining the experimental subjects, it is necessary to ensure that the two classes are comparable in terms of teaching content and teaching progress, so as to ensure the scientificity and effectiveness of the experimental results.

Finally, the preparation before the experiment. For the experimental class, teachers need to be trained in

AI-assisted writing teaching tools, so that they can master the use of relevant software or platforms, including how to use AI to guide writing, generate feedback and other operations, and prepare various materials needed for AI-assisted writing teaching, such as specific writing task instructions and manuals for the use of artificial intelligence tools. For the control class, it is necessary to prepare non-AI-assisted writing teaching materials, such as conventional writing teaching materials, model essays, etc., and clarify the steps and methods of Non-AI-assisted writing teaching to ensure that the two classes are consistent in the basic teaching framework, only in the auxiliary means. There are differences.

2.4.2 Experimental Implementation Stage

According to the established teaching plan, the experimental class uses AI-assisted tools to carry out college English writing teaching, including: brainstorming and conception guidance using AI before writing, prompt grammatical and lexical errors in real time during writing, and provide comprehensive feedback and evaluation with AI after writing. On this basis, the teacher combined the results of AI feedback with the actual situation of students to carry out targeted guidance and explanation, and guided students to use AI feedback to improve their writing. In contrast, the control class adopts the non-AI-assisted teaching method. Teachers guide students' writing through classroom teaching, model essay analysis, student peer review and other conventional methods, and manually correct students' compositions and provide written feedback. In order to ensure enough time to observe the influence of two different teaching methods on students' writing ability and learning effect, the whole experiment lasted for one semester.

2.4.3 Experimental Evaluation Stage

After the experiment, the students of the two classes were organized to fill in the questionnaire to collect their subjective feelings and evaluation of different teaching methods, so as to provide quantitative data support for the follow-up analysis.

Representative students were selected from each of the two classes for interviews to gain an in-depth understanding of students' writing interest, learning effect, teaching experience, teaching help, existing deficiencies and improvement suggestions in the experimental process, so as to obtain more abundant qualitative information.

On the basis of questionnaire survey and interview results, the advantages and disadvantages of different teaching methods are comprehensively compared and analyzed, and the main findings are summarized and the research conclusions are drawn accordingly.

3. Result

3.1 Results of Questionnaire

Table 6. Descriptive Statistics of English Writing Ability

	Group	N	Mean	Std. Deviation	Std. Error Mean
Learning Ability	EC	53	3.43500	.83267	.11438
	CC	55	3.26818	.78642	.10605
Language ability	EC	53	3.35667	.81893	.11285
	CC	55	3.26364	.79325	.10701
Thinking Quality	EC	53	3.46833	.79764	.10996
	CC	55	3.34545	.76983	.10376
Cultural Awareness	EC	53	3.52083	.78952	.10847
	CC	55	3.40000	.75869	.10228
Teaching Mode Evaluation	EC	53	3.90833	.71865	.09873
	CC	55	3.71667	.73684	.09951
Overall scale	EC	53	3.53783	.79246	.10885
	CC	55	3.39879	.76927	.10373

Note. EC = Experimental Class; CC = Control Class. Descriptive statistics show that the experimental class obtained slightly higher mean scores across all dimensions.

Table 7. Independent Sample t-test Analysis of Questionnaire

Levene's Test for Equality of Variances		T-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Learning Ability	Equal variances assumed	.762	.384	1.012	106	.314	.16682	.16487	-.15998	.49362
	Equal variances not assumed			1.010	105.653	.315	.16682	.16514	-.16054	.4948
Language Ability	Equal variances assumed	.518	.473	.578	106	.564	.09303	.16100	-.22637	.4123
	Equal variances not assumed			.577	105.711	.565	.09303	.16122	-.22684	.4120
Thinking Quality	Equal variances assumed	.691	.408	.763	106	.447	.12288	.16103	-.19660	.4426
	Equal variances not assumed			.762	105.598	.447	.12288	.16129	-.19713	.4429

Cultural Awareness	Equal variances assumed	.442	.507	.771	106	.442	.12083	.15670	-.18982	.4318
	Equal variances not assumed			.770	105.662	.443	.12083	.15692	-.19031	.4317
Teaching Mode Evaluation	Equal variances assumed	.326	.569	1.327	106	.187	.19167	.14445	-.09476	.4780
	Equal variances not assumed			1.326	105.726	.188	.19167	.14462	-.09520	.4784

Note. Levene's test showed homogeneity of variance (all Sig.>0.05). All dimensions produced $p>0.05$ without statistically significant group differences.

Table 8. Independent Samples t-test Results of English Writing Ability between Experimental Group and Control Group

Variable	Group	N	Mean	SD	t value
Learning Ability	Experimental Group	53	3.435	0.833	1.012
	Control Group	55	3.268	0.786	
Language Ability	Experimental Group	53	3.357	0.819	0.578
	Control Group	55	3.264	0.793	
Thinking Quality	Experimental Group	53	3.468	0.798	0.763
	Control Group	55	3.345	0.770	
Cultural Awareness	Experimental Group	53	3.521	0.790	0.771
	Control Group	55	3.400	0.759	
Teaching Mode Evaluation	Experimental Group	53	3.908	0.719	1.327
	Control Group	55	3.717	0.737	
Overall scale	Experimental Group	53	3.538	0.792	0.987
	Control Group	55	3.399	0.769	

Note. T-test results confirmed no statistically significant differences between groups for all measured variables.

3.2 Analysis of Interview Results

This study conducted a semi-structured one-on-one interview with 10 students in the experimental group and the control group, focusing on five core dimensions: writing interest, learning outcomes, teaching experience, teaching aids, deficiencies and suggestions. After transcription, content organization and topic analysis, the subjective feedback of the students in the two classes was obtained as a supplement to the questionnaire survey to understand the writing teaching effect of the experimental class and the control class more comprehensively.

3.2.1 Interest in Writing

Table 9. Feedback Statistics of Students' Writing Interest in the Two Classes

Class	Significantly increased interest	No significant change	Decreased interest
Experimental class (AI -assisted)	8 persons (80%)	2 persons (20%)	0 persons (0%)
Control class (Non-AI -assisted teaching)	2 persons (20%)	3 persons (30%)	5 persons (50%)

Note. 80 % of experimental-class students reported improved writing interest, which was far higher than the control-class proportion.

3.2.2 Learning Effect

Table 10. Feedback Statistics of Learning Effect of Students in Two Classes

Class	Significant effect	Medium effect	Limited effect
Experimental class (AI -assisted)	7 persons (70%)	3 persons (30%)	0 persons (0%)
Control class (Non-AI- assisted teaching)	1 person (10%)	5 persons (50%)	4 persons (40%)

Note. Subjective perceptions of learning effectiveness were more positive among experimental-class participants.

3.2.3 Classroom Differences

Table 11. Statistics of Class Difference Feedback between Two Classes

Class	Highly interactive	Average interaction	Insufficient interaction
Experimental class (AI -assisted)	9 persons (90%)	1 person (10%)	0 persons (0%)
Control class (Non-AI -assisted teaching)	0 persons(0%)	2 persons(20%)	8 persons(80%)

Note. Most experimental-class students perceived high classroom interactivity under AI-assisted instruction.

3.2.4 Capability Improvement

Table 12. Feedback Statistics of Students' Ability Improvement in Two Classes

Capability dimension	Experimental class (AI assisted)	Control class (Non-AI-assisted teaching)
Lexical and grammatical accuracy	10 persons (100%)	6 persons (60%)
Richness of writing materials and contents	8 persons (80%)	3 persons (30%)
Article structure and logical thinking	7 persons (70%)	2 persons (20%)
Appropriateness of cultural expression	6 persons (60%)	1 person (10%)
Autonomous Learning Ability	5 persons (50%)	1 person (10%)

Note. Experimental-class positive feedback rates were higher across every writing-ability sub-dimension.

3.2.5 Deficiencies and suggestions for improvement

Table 13. Statistics of Shortcomings and Improvement Suggestions Feedback from Students in two Classes

Dimension	Experimental Class (AI Assisted)	Control class (Non-AI-assisted teaching)
Main shortcomings	Incomplete functionality and insufficient logical analysis: 6 people (60%) Complex operation affects efficiency: 4 people (40%) Mild technical dependence: 3 people (30%)	Low feedback efficiency and long cycle: 9 people (90%) Lack of personalized guidance: 8 people (80%) Teaching format monotonous: 8 people (80%)
Improve expectations	Optimize deep evaluation: 7 people (70%) Simplified user interface: 6 people (60%) Strengthen teacher guidance: 8 people (80%)	Fast feedback speed: 10 people (100%) Personalized support: 9 people (90%) Diversified teaching organization: 8 people (80%)

Note. Students reported respective drawbacks for each teaching mode and put forward targeted optimization suggestions.

4. Discussion

4.1 Key Findings

This paper takes the English course of Hubei polytechnic university as the research object. In the one-semester experiment, through questionnaires, offline interviews and SPSS independent sample t-test, combined with artificial intelligence-assisted teaching methods, the effects of artificial intelligence-assisted education on students' English writing ability were compared and discussed. After a semester's teaching experiment, descriptive statistics show that students in the experimental class perform better than those in the control class in the five core dimensions of English writing: learning ability, language ability, thinking quality, cultural awareness and teaching mode evaluation, with higher average scores in all dimensions. However, the independent sample t test showed that the p values of all dimensions were greater than 0.05, which did not reach the statistical significance level. This result does not mean that artificial intelligence-assisted teaching is ineffective, but it may be due to the relatively short intervention period, the similar writing foundation of the two classes before the experiment, and the limited sample size. In terms of vocabulary and grammar accuracy, richness of writing materials, article structure and logical thinking, appropriateness of cultural expression (avoiding Chinglish) and autonomous learning ability, the experimental class showed an advantage in average scores, which initially reflected the potential role of AI-assisted teaching in improving students' writing ability through instant feedback and personalized guidance. The results of offline interviews further support this positive trend. Specifically, 80% of the students in the experimental class think that

AI-assisted teaching has increased their interest in writing, and 70% of the students think that the learning effect is significant (another 30% of the students say that the effect is moderate), far exceeding the corresponding proportion of the control class. Most of the students in the experimental group positively affirmed the role of artificial intelligence tools in error feedback, material collection and grammatical accuracy improvement, while the students in the control group mainly mentioned the problems of slow feedback, repetitive content and single interaction in Non-AI -assisted teaching. In general, artificial intelligence-assisted teaching can improve the classroom atmosphere of college English writing, improve students' initiative and comprehensive writing level, and become a promising method to make up for the shortcomings of Non-AI-assisted teaching. However, attention should also be paid to the limitations of current artificial intelligence tools in terms of functional depth and the risk of students' dependence on technology.

4.2 Interpretation of Data Significance

The coexistence of insignificant quantitative questionnaire results and obvious positive qualitative interview feedback constitutes the core feature of the data set of this study. Statistically insignificant t-test results ($p > 0.05$) showed that AI-assisted instruction could not produce measurable large-scale objective differences in students' self-reported writing ability scores under a short-term intervention of one semester. However, the consistent high average of all questionnaire dimensions cannot be excluded; they reveal the obvious beneficial trend brought by artificial intelligence-supported teaching. The interview data provided supplementary evidence: a high proportion of participants in the experimental class reported the improvement of writing interest, interaction and multifaceted writing sub-competence. This shows that although the overall questionnaire score at the group level has not yet reached statistical significance, individual learners have perceived specific changes in learning experience. The results of this mixed method show that subjective learner experience is sensitive to short-term teaching interventions, while quantitative improvement at the group level requires a longer teaching cycle to accumulate and appear. In addition, students' feedback on tool defects and technology dependence provides real-world empirical evidence for the actual risks of applying artificial intelligence tools in college English writing classes.

4.3 Theoretical Explanation from the Perspective of Connectivism and Constructivism

The empirical results of this study can be explained under the dual theoretical framework of connectivism learning theory and constructivism learning theory. According to George's Connectivism Simmons, learning is a process of establishing connections in a dynamic knowledge network, not just internal knowledge memory. In this quasi-experiment, artificial intelligence tools play an important role as external cognitive nodes in learners' writing-related knowledge networks. The interview found that students in the experimental class can obtain immediate grammar correction and personalized writing resources, which is consistent with the role of artificial intelligence in expanding learners' access to language resources and feedback loops. Although the quantitative results of the questionnaire showed no statistically significant difference between the groups, the higher average score of the learning

ability dimension reflects that artificial intelligence helps students establish a multi-source connection between writing materials, feedback and peer communication, which is consistent with the core proposition of connectivism. Constructivism holds that learners actively construct meaning based on previous experience in real situation interaction. In the artificial intelligence-assisted writing class, artificial intelligence provides an intelligent support for students' meaning construction activities: pre-writing brainstorming support, real-time error prompts, and multi-dimensional post-writing feedback create conditions for repeated review and reflective thinking. The interview data showed that the experimental participants reported higher writing interest and classroom participation. This shows that the situation supported by artificial intelligence stimulates students' active knowledge construction, rather than passive knowledge acceptance. However, the technical dependence reported by some experimental subjects also reminds us that artificial intelligence scaffolds should not replace learners' independent construction of writing thinking, which is a practical constraint derived from the constructivism hypothesis. The short-term one-semester intervention may only produce positive changes in the average level, but not significant statistical differences, because the construction of knowledge meaning is a gradual process.

4.4 Comparison with Previous Studies

Existing scholarship on writing instruction, artificial-intelligence education and AI-assisted L2 writing provides important reference points for interpreting the outcomes of the present quasi-experiment.

In terms of general writing-teaching research, international studies have shifted their focus from pure linguistic form instruction toward social-cultural and process-oriented paradigms. Siemens (2005) regarded writing as node-building activities within dynamic digital networks, while Ware and Warschauer (2005) pointed out that writing is essentially a social practice of meaning negotiation in technological contexts. Lundstrom and Baker (2009) further demonstrated the educational value of peer review: reviewers themselves gain greater writing-ability improvement than reviewees, which underpins the peer-evaluation segment adopted in this AI-supported classroom. Domestic research also advocates process-driven, thinking-oriented writing pedagogy and the construction of evaluation-for-learning closed-loop teaching (Ding, 2025; Zhao, 2024). Consistent with these viewpoints, our interview results show that students valued multi-form interactive activities in AI-assisted classes beyond simple error correction.

Regarding artificial-intelligence application in education, foreign literature highlights that AI's teaching value depends heavily on learners' digital literacy and metacognitive strategies rather than tool functions alone (Chassignol et al., 2018; Zhang & Hyland, 2025). Domestic researchers similarly warn that technical tools cannot replace teachers; AI should undertake repetitive mechanical tasks so that instructors can concentrate on higher-order-thinking guidance (Cao et al., 2025). This aligns with our interview feedback: participants affirmed AI's convenient instant feedback but also warned of incomplete logical evaluation functions and risks of technical dependence. Our non-significant quantitative t-test results also corroborate the viewpoint from existing literature that AI-teaching effects

are constrained by sample size and intervention length.

For the specific field of AI-assisted English-writing instruction, Hyland (2015) laid the theoretical foundation of process-writing pedagogy, offering a natural framework for AI-supported brainstorming, drafting and revision. Kalantzis and Cope (2010) emphasized the role shift of teachers from knowledge authorities to “designers of learning environments” in digital writing classrooms. Empirical studies abroad confirm that automated writing evaluation effectively optimizes learners’ linguistic accuracy, yet its performance on deep logical and argumentative analysis remains limited (Shi et al., 2025). Domestic empirical research echoes such conclusions: AI tools perform well in surface-level linguistic revision, whereas cultivation of critical thinking and cultural awareness still relies on human intervention (Jiao, 2025; Han, 2025).

To sum up, the present study’s mixed-method findings are largely consistent with the above-mentioned domestic and international research conclusions. Meanwhile, this study adds local empirical evidence collected from Chinese non-English majors under one-semester short-term intervention. Different from many previous studies which centered on writing-product indicators, this research mainly focuses on students’ subjective learning perceptions. The co-existence of positive subjective experience and non-significant group quantitative differences supplies supplementary insight for understanding the real-world effects of human-machine-collaborative college-English-writing teaching.

5. Conclusion

5.1 Summary of Major Findings

This study set out to investigate the practical impact of AI-assisted teaching integration on college English writing performance through a one-semester quasi-experiment involving 108 non-English major students at Hubei Polytechnic University. By combining quantitative questionnaire data with qualitative interview feedback, the research yielded several important findings.

First, descriptive statistics revealed that the experimental class, which adopted AI-assisted instruction, outperformed the control class in all five measured dimensions of writing ability—learning ability, language ability, thinking quality, cultural awareness, and teaching mode evaluation. However, independent sample t-tests showed that these differences did not reach statistical significance ($p > 0.05$). This suggests that while AI-assisted teaching exhibits a positive trend, a one-semester intervention may be insufficient to produce measurable large-scale objective improvements at the group level.

Second, the qualitative interview data provided much more pronounced and encouraging results. A substantial majority of experimental-class students reported enhanced writing interest (80%), positive learning effects (70%), and high classroom interactivity (90%). These subjective perceptions were far more favorable than those of the control class, where students predominantly cited slow feedback, monotonous teaching formats, and lack of personalized guidance as major drawbacks. This mixed-method pattern—non-significant quantitative differences alongside strong qualitative

positivity—indicates that students' learning experiences and engagement are more immediately sensitive to AI-supported pedagogical innovations than objective test scores.

Third, students in the experimental group identified specific benefits of AI tools, including real-time grammatical error correction, enriched writing materials, and improved lexical accuracy. At the same time, they pointed out notable shortcomings, such as incomplete logical evaluation functions, complex user interfaces, and the risk of mild technical dependence. These findings highlight both the promise and the current limitations of AI-assisted writing pedagogy.

5.2 Limitations of the Study

Despite its contributions, this study has several limitations that should be acknowledged.

First, the research subjects were confined to 108 lower-division undergraduate students from two English classes at a single institution—Hubei Polytechnic University. The sample predominantly consisted of science majors, with limited disciplinary diversity. Consequently, the generalizability of the findings to other university types, student cohorts, or different grade levels remains to be further verified.

Second, the intervention lasted only one semester, which can only capture short-term effects of AI-assisted teaching. This timeframe is insufficient for tracking the long-term development of students' writing proficiency or observing the staged characteristics of writing skill improvement over an extended period. The non-significant t-test results may partly reflect this temporal constraint, as meaningful writing development often requires sustained practice and cumulative feedback cycles.

Third, as noted in the limitations text, the evaluation system relied primarily on questionnaire surveys and offline interviews. No text-based analysis of students' actual writing products—in terms of lexical richness, syntactic complexity, logical coherence, or rhetorical structure—was conducted. This limits the objectivity and comprehensiveness of the ability assessment, as self-reported perceptions may not fully align with actual writing performance.

Fourth, this study only performed an overall comparison between the experimental and control groups without examining how demographic factors such as gender, major, or prior writing proficiency might moderate the effects of AI-assisted instruction. Consequently, it cannot clearly explain learning differences among various student subgroups, making it difficult to provide detailed guidance for stratified or differentiated teaching practices.

5.3 Implications and Future Research Directions

The findings of this study carry several pedagogical implications. For teachers, AI-assisted tools can serve as valuable supplementary resources to enhance feedback efficiency, diversify instructional formats, and stimulate student engagement. However, the persistent risk of technical dependence and the incomplete reasoning capabilities of current AI systems underscore the irreplaceable role of teacher guidance in fostering higher-order thinking, logical argumentation, and cultural awareness. For students, AI tools can facilitate autonomous learning and provide timely scaffolding, yet they should be

encouraged to use such tools critically and reflectively, rather than passively accepting automated outputs.

Future research should address the above limitations through several avenues. First, expanding the sample size and including participants from multiple universities, disciplines, and grade levels would enhance the external validity of findings. Second, extending the intervention period to at least two semesters or a full academic year would allow researchers to track the long-term trajectory of writing development and determine whether quantitative differences become statistically significant over time. Third, incorporating text-based analyses—such as computational linguistic metrics (e.g., lexical diversity, syntactic complexity, cohesion indices) or human-rated holistic scoring—would establish a more robust and multidimensional evaluation system. Fourth, future studies should conduct subgroup analyses to examine how individual differences (gender, major, prior proficiency, digital literacy) interact with AI-assisted instruction, thereby informing more targeted and personalized teaching strategies. Finally, experimental designs with multiple measurement points (pre-test, mid-test, post-test, and delayed post-test) would help illuminate the dynamic process of writing improvement under human-computer collaborative learning environments.

In conclusion, while the quantitative evidence from this study does not confirm a statistically significant advantage of AI-assisted teaching over traditional methods in the short term, the consistently positive trends in mean scores and the overwhelmingly favorable qualitative feedback suggest that AI integration holds substantial potential for enriching college English writing instruction. With prolonged intervention, improved tools, and more refined evaluation frameworks, AI-assisted pedagogy is likely to become an increasingly effective and indispensable component of contemporary language education.

References

- Cao, Y. S., He, L. F., & Zhao, Z. Q. (2025). An empirical study on the deep integration of artificial intelligence and English education for the improvement of English competence. In *Proceedings of the 2025 Higher-Education Development Forum: Smart-Education Sub-Forum (Volume II)* (pp. 147-148). Guangdong University of Foreign Studies South China Business College. (in Chinese)
- Chassignol, M., Khoroshavin, A., Klimova, A., et al. (2018). Artificial intelligence trends in education: A narrative overview. *Procedia Computer Science*, 136, 16-24.
- Ding, S. F. (2025). Close integration of teaching-assessment-learning: Research on junior high-school English-writing classroom teaching under the concept of integrated teaching-assessment-learning. *Anhui Education Research*, (29), 56-59. (in Chinese)
- Han, Y. (2025). Human-computer collaboration: English-writing teaching integrating thinking schemas and AI-powered revision. *Teaching Monthly (Primary-School Comprehensive Edition)*, (10), 14-17. (in Chinese)
- Hyland, K. (2015). *Teaching and researching writing*. Routledge.

- Jiao, J. X. (2025). Research on AI-empowered college-level English-writing teaching in the Higher-Education 5.0 era. *University*, (29), 185-188. (in Chinese)
- Kalantzis, M., & Cope, B. (2010). The teacher as designer: Pedagogy in the new media age. *E-learning and Digital Media*, 7(3), 200-222.
- Lundstrom, K., & Baker, W. (2009). To give is better than to receive: The benefits of peer review to the reviewer's own writing. *Journal of Second Language Writing*, 18(1), 30-43.
- Shi, H., Chai, C. S., Zhou, S., et al. (2025). Comparing the effects of ChatGPT and automated writing evaluation on students' writing and ideal L2 writing self. *Computer Assisted Language Learning*, 1-28.
- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning*, 2(1), 3-10.
- Ware, P. D., & Warschauer, M. (2005). Hybrid literacy texts and practices in technology-intensive environments. *International Journal of Educational Research*, 43(7-8), 432-445.
- Zhang, Z., & Hyland, K. (2025). The role of digital literacy in student engagement with automated writing evaluation (AWE) feedback on second language writing. *Computer Assisted Language Learning*, 38(5-6), 1060-1085.
- Zhao, C. J. (2024). Research on senior-high-school writing-teaching strategies from the perspective of knowledge categorization. *Modern Basic-Education Research*, 53(01), 207-213. (in Chinese)