Education Insights

Article

Comparative Empirical Study on GAI-Enabled POA and Traditional POA Teaching Modes: A Case Study of College English Writing

Jingbo Hu [1,*]

[1] Foreign Languages Department, Chengde Medical University, Chengde, Hebei, 067000, China
* Correspondence: Jingbo Hu, Foreign Languages Department, Chengde Medical University, Chengde, Hebei, 067000, China

Abstract: This study focuses on the differences in the effectiveness of GAI-enabled POA and traditional POA teaching modes in college English writing teaching, and conducts an empirical analysis through a quasi-experimental design. Eighty-two undergraduate students were selected as the research subjects and randomly divided into an experimental group (GAI-enabled POA mode) and a control group (traditional POA mode) for a 16-week teaching experiment. The research tools included writing test papers, the Learning Motivation Scale, the Independent Learning Ability Questionnaire, and interviews, which were quantitatively analyzed using SPSS 26.0 and qualitatively analyzed using NVivo 12. The results showed that: (1) the experimental group's total writing scores and scores on content, structure, and language subscales were significantly higher than those of the control group ($P<0.001$), and the improvement was more obvious for middle and low level students; (2) the experimental group's scores on motivation for learning and independent learning ability were significantly better than those of the control group ($P<0.001$); (3) the teachers and students are more receptive to the GAI-enabled POA model, but there is a risk of overdependence. The study confirms that GAI can effectively improve the effect of writing teaching by optimising the POA mode, which provides practical reference for the reform of university English writing teaching.

Keywords: GAI-enabled POA; college English writing; teaching modes comparison; empirical study

Published: 30 September 2025

1. Introduction

In the era of deep integration of globalization and digitalization, the teaching mode of the English language is undergoing a profound change from traditional classroom to intelligent collaboration. College English writing, as a key carrier of language output ability, is still facing challenges, including but not limited to homogenization of students' writing content and weak structural logic, lagging feedback and difficulty in realizing personalized guidance by teachers, and the dilemma of "separation of learning and use" [1-3].

As a foreign language teaching theory with Chinese local characteristics, the output-oriented approach (POA), with the core process of "driving-enabling-evaluating" and the emphasis on "learning and using as a whole", has shown remarkable results in English language and writing teaching. An empirical study showed that POA-based teaching can improve students more significantly than traditional teaching groups in terms of total writing score, content depth, and structural completeness [1]; another study found that POA can improve the discursive skills of college students' argumentative essay writing, including logic and profundity [4]. However, the traditional POA model still has limitations: the facilitation relies on teachers' subjective experience, the evaluation criteria

are difficult to unify, and it is difficult to take into account the individual differences of students in a large classroom [5,6].

The explosive development of Generative Artificial Intelligence (GAI) provides new possibilities to break through the above limitations. The big language model represented by ChatGPT can achieve real-time grammar correction, content expansion, and structure optimization, and its application in language teaching has demonstrated the advantages of efficiency and personalization [7]. However, the practice of AI-enabled POA is still in the exploratory stage, with problems such as insufficient adaptability of technological tools to teaching goals and difficulties in transforming the role of teachers from "knowledge transmitters" to "intelligent collaborators" [8]. In this context, exploring how GAI can accurately empower the POA teaching mode and form a scientific comparison with traditional POA has become a key issue for the breakthrough of college English writing teaching.

This study focuses on the integration of GAI and POA, and systematically compares the differences between the traditional POA model and the GAI-enabled POA model in college English writing. On the one hand, the theoretical system of "technology-enabled foreign language teaching" is enriched by analyzing the role of GAI in the "driving-enabling-evaluating" process; on the other hand, through the comparative analysis, the effect of GAI in English writing is analyzed [7]. The research results can directly provide teachers with specific application paths for GAI tools to alleviate the burden of teaching; provide personalized learning scaffolds for students to enhance their motivation and autonomy of writing; and provide reform of foreign language teaching in colleges and universities to promote the implementation of "Intelligence + Education" [2,9].

2. Literature Review

2.1. Research on the Application of POA in English Writing Teaching

The application of POA in English writing teaching has been widely verified since it was proposed, and its core value lies in solving the problem of "separation of learning and use" through "output-driven input". Empirical studies have shown that POA can significantly improve students' comprehensive writing ability. An experiment showed that the experimental group's total writing score, content relevance and structural logic in the posttest were significantly higher than that of the control group, and the target language items were used more frequently; a study on academic English writing further proved that the POA group's improvement in linguistic accuracy, depth of content, and structural completeness were higher than the control group [1,10]. This indicates that POA can effectively strengthen the connection between input and output through the closed-loop design of "driving to enabling".

In terms of sub-dimensions, POA has the most significant impact on facilitating writing structure. POA can assist students in developing a structured writing mindset through explicit discourse logic. Additionally, POA's role in cultivating critical thinking skills has also been confirmed. A qualitative study showed that college students' logic, depth, and flexibility in argumentative essay writing improved markedly after POA instruction [4].

Despite the effect, there are still practical limitations in the traditional POA model. First, the accuracy of facilitation is insufficient. Researchers pointed out that traditional POA relies on teachers' subjective judgment of the appropriateness of input resources, making it difficult to meet the individual needs of students; second, the timeliness of evaluation feedback is insufficient [5]. Researchers found that traditional POA has a long feedback period (3-5 days on average), which reduces students' motivation to correct errors; third, the authenticity of task design is limited [2]. Researchers mentioned that most of the writing tasks in traditional POA are based on textbooks, which are out of touch with the real communicative scenarios, and it is difficult to stimulate students' intrinsic motivation [6].

2.2. Research on the Application of GAI in English Writing Teaching

With the maturity of big language modelling technology, the application of GAI in English writing teaching has become a research hotspot, with its core function focusing on assisting output and optimizing feedback. GAI tools show multi-dimensional support in writing teaching, including the language level, the content level, and the structural level [5,7,8]. In addition, GAI has the advantage of personalization: it can provide students with hierarchical resources according to their writing level, such as sentence templates for weak students and style optimization guidance for advanced students [7].

Despite the significant advantages, the application of GAI in writing teaching still faces controversy. On the one hand, over-reliance on GAI may lead to students' thinking inertia, such as directly applying AI generated content rather than thinking independently [8]; on the other hand, GAI feedback is not humanistic enough: its judgement of writing emotions and cultural appropriateness is weaker than that of teachers, and it may ignore the implicit rules of intercultural communication [11]. In addition, teachers' ability to use GAI tools varies [8], which also restricts the promotion of GAI.

2.3. Current Research Status of GAI and POA Integration

At present, the research on integrating GAI and POA is in its infancy, and the existing results focus on the feasibility of technological intervention and the construction of preliminary models. A researcher proposed the "COPILOTS human-computer collaboration model" [7], which specifies the roles of GAI in POA: assisting teachers in generating diversified writing tasks (driving session), intelligently analyzing students' pre-produced texts to locate the needs (facilitating session), and automating the generation of feedback (evaluation session). Teachers filter resources, interpret feedback, and guide reflection. The model was validated in small-scale teaching, and students' writing efficiency increased by about 30% [7].

From the perspective of practical dilemmas, Shen pointed out that GAI-enabled POA needs to address three core issues: the suitability of the tool's functionality and POA goals (e.g., avoiding the disconnect between GAI-generated tasks and the syllabus), the division of power and responsibility between teachers and GAI (e.g., teachers need to retain the dominant right to incorporate the elements of ideology and politics), and the risk of students' over-reliance on GAI [8]. These points provide warnings for the deep integration of GAI and POA.

There are obvious shortcomings in the existing studies. Firstly, there is a lack of comparative empirical studies which systematically compare the differences in the effects of GAI-enabled POA and traditional POA, making it difficult to clarify the actual value of the technological intervention; secondly, there is a single application scenario, with most of the existing explorations focusing on general English writing, and insufficient research on the suitability for different genres; and thirdly, there is weak acceptance research on the psychological impact of using GAI-enabled modes of learning on both teachers and students [8].

In summary, existing research provides a foundation for the feasibility of GAI-enabled POA, but lacks a systematic comparison of the two modes. This study is an empirical exploration of this gap, and by comparing the effects of GAI-enabled POA with the traditional POA mode, it can provide an important reference to fill in the research gaps and promote the innovation of teaching practice.

3. Methodology

This study adopted a quasi-experimental design to select non-English major classes of the same level as the research subject and implement GAI-enabled POA teaching (experimental group, N=42) and traditional POA teaching (control group, N=40), respectively. Data were collected through pre-tests, post-tests, questionnaires, and interviews. The effects of the two modes were compared with quantitative and qualitative

analyses. To ensure the homogeneity of the two groups of students, a pre-test of English writing was administered before the experiment (argumentative essay writing, with a score of 30 points), and an independent samples t-test showed that there was no significant difference between the pre-test scores of the two groups (t=0.32, P=0.75>0.05), which was in line with the requirements of the experimental study. The post-test was implemented after the experiment, and the difficulty was the same as that of the pre-test, which was used to compare the changes in the writing ability of the two groups; the test was evaluated using a double-blind scoring method, in which the test was independently scored by two teachers with more than 5 years of experience in teaching English writing. The rater reliability coefficient was tested to be 0.87, which meets the requirements of the study.

The Foreign Language Learning Motivation Scale was adapted and adjusted to 20 questions with the scenario of this study, containing three dimensions: intrinsic motivation (7 items), perceived task value (7 items), and self-efficacy (6 items) [12]. The Independent Learning Ability Questionnaire was designed to contain 18 questions covering three dimensions: goal setting (6 items), strategy use (6 items), and self-monitoring (6 items) [2]. The questionnaires were scored on 5-point Likert scales, with Cronbach's alpha coefficients of 0.82 and 0.80, respectively, indicating satisfactory reliability. The two questionnaires were distributed 1 week after the end of the experiment to the experimental group and the control group, and 78 valid questionnaires were recovered (effective recovery rate of 95.1%), which were used to compare the differences in motivation and independent learning ability between the two groups.

One week after the experiment, 8 students (3, 3, and 2 each at high, medium, and low writing levels) were randomly selected from the experimental group, and the teacher as well, to conduct semi-structured interviews lasting 20-30 minutes each, which were audio-recorded and transcribed into text. Student interview outline (8 questions) focused on the experience of using the GAI tool and the learning experience. Teacher interview outline (6 questions) focused on the difficulties of teaching implementation and evaluation of the model.

4. Data Analysis and Results

The mean score on the pre-test for the experimental group was 18.26 (SD=2.35) and for the control group was 17.98 (SD=2.51), and the independent samples t-test showed that there was no significant difference in the scores of the two groups (P>0.05), which indicated that the two groups were homogeneous in terms of their level of writing before the experiment. The mean posttest score of the experimental group was 24.35 (SD=2.18) and that of the control group was 20.72 (SD=2.46), and the independent samples t-test showed that the performance of the experimental group was significantly higher than that of the control group (P<0.001), which indicates that the GAI-enabled POA model had a more significant effect on the improvement of the total writing score. The data analysis results of each dimension are shown in Table 1.

Table 1. Dimensions of writing scores.

Dimension	M±SD		t	p
	Experimental group	Control Group		
Content	8.12±1.05	6.75±1.21	5.47	<0.001
Structure	8.03±0.98	6.52±1.13	5.96	<0.001
Language	8.20±0.87	7.45±1.02	3.68	<0.001

As analysed by ANOVA, low and intermediate level students showed significantly higher achievement gains in the experimental group than in the control group; the difference in gains between the two groups was smaller for high level students. This

indicates that the GAI-enabled POA model helps low and middle-level students more significantly. The results of the specific data analysis are shown in Table 2.

Table 2. ANOVA results.

Level	Pretest → Posttest		F	p
	Experimental group	Control Group		
Low	14.23→20.15	13.98→16.82	12.36	<0.001
Intermediate	18.56→24.89	18.21→21.05	9.72	<0.01
High	22.15→27.68	22.32→25.91	2.18	>0.05

The analysis of the results of the learning motivation scale showed that the experimental group scored significantly higher than the control group in all dimensions (P<0.05), indicating that the GAI-enabled POA model is more capable of stimulating students' motivation to write through immediate feedback and personalized support, which is in line with the conclusion that "technology empowerment enhances the sense of achievement in learning" [9]. The data analysis results are shown in Table 3.

Table 3. Learning motivation scale data analysis results.

Dimension	M±SD		t	p
	Experimental group	Control Group		
Intrinsic motivation	4.21±0.53	3.68±0.61	4.52	<0.001
Perceived value of the task	4.35±0.48	3.82±0.57	4.76	<0.001
Self-efficacy	4.18±0.55	3.59±0.63	4.31	<0.001

The results of the independent learning ability questionnaire showed that the experimental group scored significantly higher than the control group in the dimensions of strategy use and self-monitoring (P<0.01), and there was no significant difference in the dimension of goal setting (P>0.01). The results showed that the use of GAI tools motivated students to use writing strategies and monitor the learning process more actively, which verified the idea of "intelligent tools can strengthen independent learning" [2]. The details are shown in Table 4.

Table 4. Independent learning ability questionnaire data analysis.

Dimension	M±SD		t	p
	Experimental group	Control Group		
Goal setting	3.98±0.62	3.72±0.68	1.98	0.052
Strategy use	4.05±0.57	3.51±0.65	4.23	<0.001
Self-monitoring	4.12±0.54	3.63±0.61	4.07	<0.001

The analysis of the interview data shows that 87.5% of the students think that GAI's instant feedback (e.g., "Grammatical errors can be marked immediately, so I don't have to wait for the teacher to correct them") and content expansion functions (e.g., "ChatGPT can give me examples and help me write concrete ideas") are the most valuable; 62.5% of students mentioned that GAI's personalized support (e.g., "It suggests sentence patterns according to my level, unlike the uniform lectures in class") enhanced learning efficiency. 50% of students said they had relied too much on GAI-generated content (e.g., "Sometimes I would just copy the sentences it gave me"; 37.5% of the students thought that GAI feedback lacked emotional warmth (e.g., "It would only say where I was wrong, not encourage me like a teacher").

Teachers generally recognized the role of GAI in facilitation, especially for low and intermediate-level students. Teachers suggested that there is a need to clarify the boundaries between GAI and teachers' authority and responsibility, and to strengthen the training of students in the rational use of GAI, to avoid over-reliance on it.

5. Conclusion

The following conclusions can be drawn from the results of the study: firstly, the GAI-enabled POA model is significantly more effective than the traditional POA model in college English writing teaching, which can significantly improve students' total scores as well as their performance in content, structure, and linguistic accuracy; secondly, the model is more effective in stimulating students' motivation for writing (including intrinsic motivation, perceived value of the task, and self-efficacy), and in reinforcing their independent learning ability (especially in the dimensions of strategy use and self-monitoring); lastly, teachers and students are more receptive to the GAI-enabled model, but the risk of over-reliance on the tool should be clarified.

Based on the above conclusions, the following pedagogical insights can be obtained: for teachers, they need to change their roles from "knowledge transmitter" to "intelligent collaborator", use GAI tools to reduce load and increase efficiency, focus on higher-order thinking guidance, and cultivate their ability to use intelligent tools critically. For course design, the integration path between GAI and POA should be optimized, such as designing authentic contextual tasks in the driving session, providing layered resource packages in the facilitating session, and constructing a diversified evaluation system of "GAI initial evaluation + teacher reassessment + students' mutual evaluation", which takes into account both efficiency and humanistic care. For effective education management, it is necessary to increase the purchase and training support of GAI teaching tools, enhance teachers' digital literacy, and establish specifications for the use of GAI in writing instruction, thereby preventing the risk of academic dishonesty.

Funding: 2025 Hebei Province General Undergraduate Institutions Foreign Language Teaching Reform Research Project "An Empirical Study of the Teaching Model Optimization Using GAI-enabled POA" (Project number: 2025YYJG031).

References

1. S. Ma, "Application of production-oriented approach in college integrated English teaching-under the background of curriculum ideological and political education," Pacific International Journal, vol. 6, no. 4, pp. 199-203, 2023.
2. X. U. Jing, and F. E. N. G. Li, "Research on the Application of "Production-Oriented Approach" Based on Blended Teaching in College English Writing Teaching in Private Undergraduate Colleges," 2021.
3. H. Zhang, "Application of Production-Oriented Approach in College English Instruction in China: A Case Study," English Language Teaching, vol. 13, no. 10, pp. 14-22, 2020.
4. C. Lei, and M. M. Mokhtar, "Impact of the Production-Oriented Approach (POA) on the Critical Thinking Skills of University Students in College English Courses: An Empirical Study," International Journal of Education and Humanities, vol. 7, no. 1, pp. 74-77, 2023. doi: 10.54097/ijeh.v7i1.5066
5. L. Qiu, "Enabling in the production-oriented approach: Theoretical principles and classroom implementation," Chinese Journal of Applied Linguistics, vol. 43, no. 3, pp. 284-304, 2020. doi: 10.1515/cjal-2020-0019
6. Y. Hongli, "Construction and Evaluation of PBL College English Teaching Test Model Based on "Product Oriented"(POA)," International Journal of New Developments in Engineering and Society, vol. 3, no. 5, 2019.
7. E. Hammer, "ChatGPT in the Classroom: The Teacher's Challenges and Opportunities in an AI Revolution," 2024.
8. H. E. Zhengye, "Exploring AI's Assistance to Teachers in Implementing the Motivating Phase of POA Theory in College English Courses," Sino-US English Teaching, vol. 22, no. 6, pp. 196-200, 2025.
9. L. Sun, H. H. Ismail, and A. A. Aziz, "Current English Language Teaching Using Production-Oriented Approach: A Systematic Review," World Journal of English Language, vol. 14, no. 4, 2024. doi: 10.5430/wjel.v14n4p101
10. Z. Liu, "The application of production-oriented approach research teaching method in medical academic English course," Plos one, vol. 19, no. 2, p. e0296249, 2024. doi: 10.1371/journal.pone.0296249
11. G. Peng, "Research and Practice of Production-oriented Approach in College English Teaching," 2025.

12. J. W. Brown, "Social Psychology and Second Language Learning: The Role of Attitudes and Motivation," RC Gardner. London: Edward Arnold, 1985. Pp. xiv+ 208. Studies in Second Language Acquisition, vol. 10, no. 3, pp. 419-421, 1988.