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A Study on English Undergraduates' Perceptions of the Role of Generative AI in English Writing Assistance: A Case Study

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Abstract. In recent years, Generative Artificial Intelligence technology has made significant progress and shown great application potential in the field of assisting English writing learning. However, most of the current academic research focuses on the technical level or the teacher's perspective, mainly focusing on the development of its functions, the design of teaching strategies, and how teachers can utilize generative artificial intelligence for teaching management. In contrast, there are relatively few studies from the students' perspective. This study takes undergraduate students majoring in English at a university in Anhui Province as the target, and explores their views on Generative Artificial Intelligence-assisted English writing from the three dimensions of emotion, behavior, and cognition by means of a questionnaire survey to provide an empirical basis for optimizing the design and pedagogical application of the generative artificial intelligence tool. A bigger and more varied sample of students from different academic programs and fields could be advantageous for future research.

Keywords: Generative Artificial Intelligence, English Major Undergraduates' Attitude, AI Assisted Writing

1. Introduction

The advent of generative artificial intelligence(GAI), particularly following the launch of ChatGPT in 2022, has generated substantial interest in the numerous advantages of teaching, including the innovation of teaching methodologies and learning patterns. It also brings concerns regarding ethical and academic integrity issues and equity of educational resources [1]. As an emerging tool, the application of GAI in English writing teaching is gradually gaining attention. In the whole English writing process, GAI can provide students with functions such as automatic writing evaluation, automatic writing feedback correction, and automatic text generation [2]. Compared with traditional English writing teaching, these functions are conducive to solving the problems of students' anxiety in writing, the need for prompt feedback, and teachers' overburden of corrections.

However, despite the promising application of GAI in English writing teaching, most of the current research in the academic community focuses on the technical level or the teacher's perspective, with the main focus on the development of its functions, the design of teaching strategies, and how teachers can utilize GAI for teaching management [3]. In contrast, there are relatively few studies from the student perspective of undergraduate English majors.

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This study will provide insights into undergraduate English majors' specific attitudes and perceptions toward GAI-assisted writing by analyzing the collected empirical data. This will help optimize the design and pedagogical application of GAI tools and support educators in developing evidence-based strategies to effectively scaffold students' use of these technologies in academic writing.

2. Literature review

In education, GAI shows great potential and value and has become the research focus by many scholars. It can improve teaching efficiency by providing instant feedback and personalized learning materials [4]. Specifically, by analyzing large amounts of data about a particular student, GAI acting as a virtual tutor can tailor teaching content and teaching methods to each student's learning preferences, strengths, weaknesses, and progress. This personalized approach improves student engagement and comprehension and leads to better learning outcomes. This technology enhances student motivation and engagement, stimulates idea generation, and develops generic skills such as critical thinking and problem-solving [5]. For example, in English language learning, the application of GAI in English writing teaching has become a hot topic in language education research. It was found that GAI has a significant advantage in providing personalized and timely feedback at the technical level, and it can significantly improve students' performance in the quality of English essays, especially in the three key areas of language use, organizational structure, and content creativity [6]. In addition, through a questionnaire survey and case study analysis of teaching practice, Wu Li found that GAI can effectively solve some of the problems existing in the role of teachers in secondary school English writing teaching, such as problems related to a single teaching method, poor quality of writing models, high pressure on teachers' corrections, and lagging evaluation feedback [7].

In contrast, the facilitating effect of GAI on English writing has been widely confirmed. As an important subject of English writing learning, many scholars have explored students through empirical studies to explore the actual effects when using GAI. For example, Mahapatra's study used a mixed-methods intervention research design to explore the impact of ChatGPT as a GAI tool on ESL students' writing skills. The study subjects were university ESL students, and the effects of ChatGPT on students' writing performance and motivation were assessed through a process of pre-test, intervention, and post-test. The results showed that students in the experimental group significantly outperformed the control group regarding English writing achievement, as evidenced by a modified mean of 81.313 for the experimental group compared to 77.330 for the control group. In addition, students' experiences with ChatGPT also effectively support content generation and language optimization [8]. Ozfidan et al.'s study shows that Saudi Arabian undergraduates generally believe that GAI tools (such as ChatGPT and Grammarly) are significant aids in academic writing, especially in generating writing ideas, preparing writing outlines, grammar and spelling checking, and saving writing time [9]. However, individual learners' attitudes toward GAI are a key factor influencing their usage, and relatively little research has been conducted in this area.

In summary, while most of the existing studies focus on technology or teacher perspectives, the present study provides an in-depth exploration of the specific attitudes and perceptions of undergraduate English majors toward GAI-assisted writing from the students' perspectives, which is of great significance for optimizing the design and pedagogical application of GAI tools. Future research should further focus on students' attitudes and needs and explore how to better guide students to use GAI reasonably in teaching and give full play to its advantages to enhance the effectiveness of English writing teaching. In addition, attention should also be paid to the problems

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that GAI may bring about in educational applications, such as the phenomenon of information cocoon, and solutions should be actively sought to ensure its healthy development in the field of education.

The following research questions guided the present study:

What are the overall attitudes of undergraduate English majors toward GAI-assisted English writing?

How can student perspectives be used to power GAI-assisted English writing?

3. Research design

3.1. Participants

Given that most university majors have relatively low English writing proficiency requirements, whereas English majors demand higher and more rigorous writing standards, undergraduate English majors are more likely to utilize GAI tools extensively to enhance their writing learning. This renders them an ideal sample for investigating students' perceptions and experiences of GAI-assisted English writing.

The sample of this study is purposive, aiming to explore in-depth the perceptions of English majors on GAI-assisted English writing learning. In addition, the university where the sample is located has actively GAI technology into the teaching process, offering relevant AI general elective courses and introducing AI-assisted correction tools, such as Critique.com, in advanced English writing courses. This technological environment provided strong support for this study, enabling it to assess the effectiveness of GAI tools and students' acceptance of them in real teaching scenarios. The sample comprised 198 undergraduate English majors (41 males and 157 females) spanning four academic years (freshman to senior), with ages ranging from 18 to 25 years old, except for one participant under 18. Although the sample size is adequate, the notable gender imbalance may affect the findings' generalizability, which should be acknowledged. They were invited to fill in the adapted questionnaire.

The data were all collected online through the Questionnaire Star platform. The definition of GAI was exhaustively explained to the subjects in the explanatory notes of the questionnaire link before the official start of the questionnaire. In addition, the researcher explicitly informed the subjects that all the responses they provided would be used strictly for the study to ensure that their privacy would be protected, and that they could withdraw their informed consent and withdraw from the study at any time if they experienced any discomfort while participating in the questionnaire.

3.2. Measures

A 3-item background questionnaire was designed to gather personal information, including gender, age, and academic grade. The GAI-assisted English learning attitude scale was a 15-item measure adapted from Wang et al.'s questionnaire designed for Chinese university students. Wang et al. reported a Cronbach's α coefficient of 0.888 for the total scale, indicating good internal consistency. The Cronbach's α coefficients for the effect, behavior, and cognition dimensions were 0.749, 0.810, and 0.762, respectively, above the acceptable threshold of 0.70. The scale was validated through exploratory and confirmatory factor analyses. The exploratory factor analysis conducted by Wang et al. revealed three distinct factors corresponding to the ABC model, with a cumulative variance explanation rate of 65.719%. The confirmatory factor analysis confirmed the three-factor structure, with fit indices meeting the criteria for good model fit ($\chi^2/df = 2.757$, CFI = 0.934, TLI = 0.917,

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RMSEA = 0.065, SRMR = 0.053). Additionally, the scale demonstrated good criterion validity, with significant positive correlations between the scale scores and scores on the Basic Psychological Needs Scale ($r = 0.450$, $p < 0.01$) [10]. Wang et al. developed this scale based on the ABC model of attitude, which was first proposed by Rosenberg et al. [11]. The ABC model posits that attitude involves affect, behavior, and cognition. This study focuses on undergraduate students in English majors and carefully adjusts the scenario of English learning in the questions to English writing, adding English writing-related questions. Among them, the affective dimension has 3 items, the cognitive dimension has 5 items, and the behavioral dimension has 7 items. All items are measured using a Likert scale.

3.3. Data analysis

SPSS 27.0 was employed to conduct reliability analysis, validity analysis, and descriptive statistics on the collected valid data to examine the psychometric properties of the measures. The data in the GAI-assisted English learning attitude scale were analyzed by descriptive analysis to show the specific attitude of undergraduate English majors toward GAI-assisted English writing.

4. Results and discussion

Table 1 shows that the reliability coefficient value is 0.949, greater than 0.7, indicating that the data is highly reliable and can be used for further analysis. The Cronbach's α coefficients for the effect, behavior, and cognition dimensions were 0.829, 0.916, and 0.858, respectively, all of which are above the acceptable threshold of 0.70. The scale was validated through exploratory and confirmatory factor analyses.

Table 1: Reliability of questionnaire(N=198)

Questionnaire	Items	Cronbach Alpha Coefficient
Generative Artificial Intelligence-assisted English Writing Questionnaire	15	0.949
Dimensions	Items	Cronbach Alpha Coefficient
Affect Dimension	3	0.829
Behavior Dimension	7	0.916
Cognition Dimension	5	0.858

Pearson correlation analysis was conducted using IBM SPSS software to assess the construct validity of the questionnaire. Table 2 shows that the correlation coefficients among the items ranged from -0.432 to 0.978, with all significance values (p-values) below 0.05, demonstrating statistically significant relationships among the items. The analysis showed that the Pearson correlation values between various variables ranged from -0.432 to 0.978, indicating a good correlation among the questions. The significance values (p-values) ranged from 0.027 to 0.000, all of which are less than 0.05, indicating that the correlations are statistically significant. Therefore, the data analysis suggests that the survey questionnaire is reliable and valid.

Table 2:Validity of questionnaire (N=198)

Questionnaire	Items	Pearson Correlation	Sig 2-Tailed
Generative Artificial Intelligence-assisted English Writing Questionnaire	15	-0.432 to 0.978	0.027 to 0.000

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4.1. Dimensional analysis of undergraduate English majors' sentiments towards GAI-assisted English writing

This study surveyed three items on the affective dimension using a five-point Likert scale, revealing a generally positive attitude among students towards using GAI in assisting English writing. The mean values for all three items ranged from 3.72 to 4.10, nearing the "Agree" and "Strongly Agree" categories on the scale, indicating that most students favor applying GAI in English writing. Specifically, Item 1 ("I find the process of using GAI to assist in English writing very interesting") and Item 2 ("I like to use GAI to solve problems encountered in English writing learning") had higher average values, at 4.10 and 4.06 respectively, demonstrating a high level of interest and acceptance among students towards GAI. Item 3 ("GAI assistance in English writing makes me feel confident and makes learning English easier") had a mean value of 3.72, slightly lower than the other two items but still positive, suggesting that GAI has a certain enhancing effect on students' confidence and motivation in learning English. Regarding data dispersion, Item 3 had the most significant standard deviation (0.956), indicating a greater variance in students' attitudes towards this item, with some students possibly experiencing less of an increase in confidence and learning convenience than others when using GAI.

The study found that over 80% of students (53.0% selecting "Agree" and 28.8% selecting "Strongly Agree") believe that the process of using GAI to assist in English writing is very interesting. This result aligns with Mahapatra, which suggests that interactive technological tools can significantly enhance students' learning motivation. As a highly interactive technological tool, GAI provides students with immediate feedback and personalized learning experiences, which may be key factors in stimulating students' interest [8]. Additionally, nearly 80% of students (48.5% selecting "Agree" and 29.3% selecting "Strongly Agree") indicated a preference for using GAI to solve problems in English writing. This result indicates a high level of acceptance among students for new technologies, reflecting the feasibility and practicality of GAI in actual applications. This high acceptance may be related to the usability and effectiveness of GAI tools, enabling students to receive writing assistance from GAI, thereby reducing learning barriers.

These data indicate that GAI enhances students' interest in learning and strengthens their autonomy and problem-solving abilities in English writing. Regarding Item 3 in Table 3 and Table 4, over 50% of students (34.3% selecting "Agree" and 23.7% selecting "Strongly Agree") believe that GAI assistance in English writing makes them feel more confident and makes learning English easier. This suggests that GAI effectively stimulates interest and boosts students' confidence and motivation to learn. It is particularly noteworthy that, based on the data from Items 1 and 3, students who find using GAI interesting (81.8%) are also more inclined to believe that GAI tools have enhanced their confidence (58.0%). This indicates a positive correlation between interest and confidence.

Table 3: Descriptive statistics for items on the affective dimension

Item	Mean	Median	Mode	Standard Deviation	Variance	Skewness	Skewness Standard Error	Minimum	Maximum
1	4.10	4.00	4	0.691	0.477	-0.229	0.173	2	5
2	4.06	4.00	4	0.749	0.560	-0.311	0.173	2	5
3	3.72	4.00	4	0.956	0.915	-0.320	0.173	1	5

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Table 4: Frequency distribution for items on the affective dimension

Option	Item 1 (N)	Item 1(%)	Item 2 (N)	Item 2(%)	Item 3 (N)	Item 3(%)
Strongly Disagree	-	-	-	-	3	1.5%
Disagree	1	0.5%	3	1.5%	14	7.1%
Neutral	35	17.7%	41	20.7%	66	33.33%
Agree	105	53.0%	96	48.5%	68	34.3%
Strongly Agree	57	28.8%	58	29.3%	47	23.7%
Total	198	100%	198	100%	198	100%

4.2. Behavioral dimension analysis of English undergraduates' behavior towards GAI-assisted English writing

As shown in Table 5, the results indicated that mean values across the behavioral dimension items ranged between 3.78 and 4.12, suggesting that most respondents expressed agreement or strong agreement regarding the benefits and application potential of GAI in English writing, although slight variations were observed across items. Notably, Item 9 has the highest mean value at 4.12, indicating respondents' willingness to engage in GAI writing training. Although Item 6 has a relatively lower mean value of 3.78, it still reflects respondents' optimistic attitude towards applying GAI in writing. Furthermore, the median and mode for all items are 4, further confirming the positive inclination of the respondents. The analysis of standard deviation and variance reveals that there is a significant variation in opinions regarding Item 6, while attitudes towards Item 8 are more consistent.

Overall, respondents demonstrate a high level of recognition and acceptance of the application of GAI in English writing, expressing a willingness to continue using it and to participate in related training. These findings underscore the potential of GAI as an educational tool.

Table 5: Descriptive statistics for items on the behavioral dimension

Item	Mean	Median	Mode	Standard Deviation	Variance
4	3.99	4.00	4	0.751	0.563
5	4.08	4.00	4	0.663	0.440
6	3.78	4.00	4	0.907	0.823
7	4.08	4.00	4	0.683	0.466
8	4.00	4.00	4	0.774	0.599
9	4.12	4.00	4	0.702	0.493
10	3.97	4.00	4	0.790	0.624

4.3. Dimensional analysis of undergraduate English majors' perceptions of GAI-assisted English writing

As shown in Table 6, in the cognitive dimension items, all mean values range from 3.84 to 4.03, indicating that respondents generally hold an open and positive attitude towards applying GAI in English writing and are willing to attempt to apply it in the writing process. Although Item 12 has a slightly lower mean value, it still falls within the positive range, suggesting that despite some uncertainty, respondents may have a slightly conservative attitude towards certain aspects of GAI (such as enhancing writing skills). Overall, they maintain an optimistic view of the potential of GAI.

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The median for all items is 4, and the mode is also 4, further confirming that most respondents tend to agree or strongly agree with the statements of each item.

In summary, respondents generally have a positive attitude towards applying GAI in English writing and are willing to try to apply it in the writing process. Although there is a certain degree of uncertainty about some specific applications (such as Item 12), overall, the acceptance and willingness to use GAI in English writing are relatively high.

Table 6: Descriptive statistics for items on the cognitive dimension

Item	Mean	Median	Mode	Standard Deviation	Variance
11	3.94	4.00	4	0.797	0.636
12	3.84	4.00	4	0.892	0.796
13	4.03	4.00	4	0.733	0.537
14	3.99	4.00	4	0.730	0.533
15	3.87	4.00	4	0.814	0.663

5. Conclusion

This study systematically investigated undergraduate English majors' attitudes toward GAI-assisted English writing and examined how students' perspectives could guide the development and improvement of GAI applications in academic writing contexts. Guided by specific research questions, the study employed a robust methodological approach, utilizing a questionnaire with high reliability, as indicated by a Cronbach's α coefficient of 0.949. The dimensions of affect, behavior, and cognition were all found to be reliable, with Cronbach's α coefficients above the acceptable threshold of 0.70.

The analysis revealed that undergraduate English majors generally hold a positive attitude towards GAI-assisted English writing, with mean values across all items indicating a tendency to agree or strongly agree with GAI's benefits and application potential. Notably, Item 9, which pertains to engagement in GAI writing training, had the highest mean value, reflecting a strong willingness among respondents to participate in such activities. Despite Item 6 having a relatively lower mean value, it still suggests an optimistic view towards applying GAI in writing.

The study also found that over 80% of students perceived the use of GAI in English writing as interesting, which may contribute to enhanced learning motivation, aligning with previous research on the motivational effects of interactive technological tools. The high acceptance rate among students for GAI indicates a high level of comfort with new technologies and reflects the feasibility and practicality of GAI in educational settings. This acceptance is likely related to the usability and effectiveness of GAI tools, which enable students to receive writing assistance from GAI, thereby reducing learning barriers.

Moreover, the findings suggest that GAI may enhance students' interest in learning and support the development of autonomy and problem-solving abilities in English writing. Over 50% of students believe that GAI assistance in English writing makes them feel more confident and makes learning English easier, suggesting that GAI effectively stimulates interest and boosts students' confidence and motivation to learn.

In summary, the study concludes that undergraduate English majors generally have a positive attitude towards GAI-assisted English writing and are willing to integrate it into their writing process. Despite some uncertainty about specific applications, the overall acceptance and willingness to use GAI in English writing are relatively high.

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The findings of this study offer valuable insights for educators considering integrating GAI tools in English writing instruction. Firstly, given students' positive attitudes towards GAI-assisted writing, educators should consider adopting GAI tools to enhance student interest and autonomy in learning. Secondly, educators can improve their understanding and application of GAI tools through training and workshops to more effectively guide their students. Furthermore, educators should explore the potential of GAI in designing personalized learning pathways to meet the diverse needs of students. Technologists should pay attention to user feedback to continuously improve the interactivity and personalization features of GAI tools to better meet the practical needs of educational settings. Additionally, ensuring GAI tools' usability and reliability is crucial for educators' and students' seamless integration and use.

Despite its contributions, this study is subject to several limitations. First, the sample size, although adequate for the analysis, is limited to undergraduate English majors from a specific university, which may affect the generalizability of the findings. Second, the study relied solely on self-reported data, which could be subject to response bias. Additionally, the cross-sectional nature of the data collection does not allow for examining changes in attitudes over time.

Future studies could benefit from a larger and more diverse sample, including students from various disciplines and educational institutions. Longitudinal research designs could be employed to track attitudes towards GAI-assisted writing changes over time. Furthermore, incorporating qualitative methods, such as interviews or focus groups, could provide a deeper understanding of students' experiences and perceptions.

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