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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.

While the application of GAI in English writing teaching holds considerable promise, most of the current academic research focuses on the technical level or the teacher's perspective. This includes the development of its functions, the design of teaching plannings, and how teachers can apply GAI to teaching management [3]. In contrast, from the student perspective of undergraduate English majors there are relatively few studies.

The research will reveal the specific attitudes and perceptions toward GAI-assisted writing of undergraduate English major by analyzing collected empirical data. These insights offer valuable

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guidance for both the design and pedagogical use of GAI tools. As a result, educators will be better equipped to develop evidence-based approaches, helping students to better navigate the intersection of technology and 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 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:

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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

For evaluating students' attitudes toward English learning, a questionnaire was prepared from the GAI-assisted English learning attitude scale developed by Wang et al. for Chinese university students. The original scale includes 15 items designed to measure students' emotional, behavioral, and cognitive responses to the use of GAI tools for learning English. After reviewing Wang et al.'s questionnaire, modifications were made to tailor it more specifically to the use of English writing. Furthermore, Wang et al. reported a Cronbach's alpha (α) of 0.888 for the overall scale, indicating good internal consistency. The coefficients of alpha for the emotional, cognitive, and behavioral dimensions were 0.749, 0.810, and 0.762 respectively, beyond the recommended threshold of 0.70 [10]. In addition, an exploratory factor analysis by Wang et al. revealed three independent factors that are related to the ABC model, leading to a total variance explanation of 65.719%. A subsequent confirmatory factor analysis confirmed its three-factor structure, and the model fit indices met the established criteria ($\chi^2/df = 2.757$, CFI = 0.934, TLI = 0.917, RMSEA = 0.065, SRMR = 0.053) [11]. These findings showed that the measure has good construct and criterion validity to measure the attitudes of students towards GAI-assisted English learning.

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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

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

Utilizing a five-point Likert scale, a total of three items about the affective value were identified, and the participants had a generally positive attitude regarding the use of GAI for English writing. The mean of the three items scores ranged from 3.72 to 4.10, which was pretty close to the "Agree" and "Strongly Agree" categories to the scale, representing evidence of strong student support for the application of GAI in use with English writing. Specifically, Item 1 ("I find the process of employing GAI to help with English writing very interesting") and Item 2 ("I enjoy utilizing GAI to tackle challenges faced as English writers") had higher mean scores, 4.10 and 4.06, respectively, indicating students' interest and acceptance of GAI.

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Item 3 ("GAI assistance in English writing makes me feel confident and makes learning English easier") had an average score of 3.72, which is marginally lower than the other two items, yet indicates a good outlook. This suggests GAI has a beneficial effect on students. In that sense, GAI does indeed provide students with confidence and motivation to learn English. In terms of data variability, Item 3 has the highest standard deviation (0.956); it suggests more diversity among students' responses that were given after learning to use GAI. Students may have experienced less of an improvement in their confidence or convenience of learning than others. Over 80% of the students (53.0% "Agree" and 28.8% "Strongly Agree") felt that the process to use GAI to promote and aid in writing in English was extremely engaging. This result provides support for Mahapatra's research that interactive technologies have a pivotal role in enhancing students' motivation to learn. GAI, as a very dynamic tool, allows students to engage instantly with responsive feedback and tailored learning opportunities (a key component to help spark student interest) [8]. More than 80% of students (48.5% "Agree" and 29.3% "Strongly Agree") preferred GAI to solve problems in English writing. This indicates that acceptance of new technologies is high, so that GAI tools are feasible in real-world implementations. This high level of acceptance probably relates to the ease of using GAI tools and their effectiveness. At the same time, it also allows students to get writing assistance and thereby lowers barriers to learning. This tells us that GAI not only increases students' engagement but also boosts their independence and problem-solving ability in English writing. In respect of Item 3 in Tables 3 and 4, over 50% of students (34.3% "Agree" and 23.7% "Strongly Agree") think GAI help in English writing helps them think that writing in English increases their confidence and helps them learning English. This means that GAI does stimulate students' interest while building their confidence and motivation. Based on data from Items 1 and 3, it is noteworthy to note that students who found GAI beneficial (81.8%) believed that GAI tools increased their confidence as well (58.0%). That suggests 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

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

Across the scales in Table 5, mean values based on the behavioral dimension items range from 3.78 to 4.12, indicating that the majority of respondents agreed or strongly agreed on the benefits and application potential of GAI in English writing, however, there are slight differences with items. Item 9 has the highest mean value at 4.12 among items, suggesting respondents' willingness to participate

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in GAI writing training. Thus, although the mean value of Item 6 is relatively lower (3.78), it still describes respondents' positive attitude to applying GAI in writing. Moreover, all item median and mode are 4, providing evidence that the respondents seem to have a favorable attitude. If analysis is done for standard deviation and variance, it shows that there are large differences in opinions with respect to Item 6, while attitudes toward Item 8 are more consistent. Generally, survey respondents show a significant degree of acknowledgement of the use of GAI in English writing and willingness to continue utilizing it along with related training. These findings highlight 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

For the cognitive dimension items in Table 6 (all mean values range from 3.84 to 4.03), it suggests that the attitude to application of GAI in writing of English is relatively open in this study, as it also seems that respondents would try to apply GAI in the writing process. While Item 12 has a lower mean for it to include GAI, it still fits under the positive range indicating that respondents may have a slightly conservative attitude toward some areas of GAI, despite some uncertainty such as improving writing skills. They remain generally hopeful about the implications of GAI. All items have a median of 4 and mode is of 4, which also shows that as a total, most of the participants are in agreement or strongly agree with each item. In conclusion, the respondents would seem to have positive attitudes that utilize GAI in English writing, and are open to the use of GAI in the process of writing. Despite there being some hesitation about some specific applications (e.g., Item 12), in general the acceptance and interest in GAI in English writing has relatively strong support.

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 may help in creating and tailoring the GAI applications in academic writing contexts. Specific research questions guided this study, and a sound methodology was implemented, utilizing the questionnaire with reliability, as displayed by a

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Cronbach's α coefficient of 0.949. These dimensions of affect, behavior, and cognition showed that they were all significant, Cronbach's α coefficients above an acceptable cutoff of 0.70.

It found that undergraduates of English major courses have a positive attitude towards GAI-assisted English writing on the average mean value for all items to be agree or strongly agree between these items for GAI for English majors' advantages and potential application possibilities. Specifically, the mean value of Item 9 pertaining to engagement in GAI writing training was the strongest, indicating a high degree of attitude from the respondents regarding engaging in similar activities. In spite of Item 6 having a lower mean value, this implies, nevertheless, a positive approach toward performing GAI in writing. More than 80% of students also found the utilization of GAI for English writing to be interesting leading to a greater motivation for learning which was also observed in previous research regarding interactive technology's motivational effect. The high acceptance of GAI by students suggests a high level of ease and comfort with new technology as well as the practicality of GAI in educational settings. This level of acceptance is perhaps closely associated with the usability and efficacy of GAI tools, allowing students to get writing assistance through GAI, effectively dismantling learning barriers. And lastly; the findings suggest that GAI may actually be good for learners and facilitate independence and problem-solving skills in English writing. More than half of students think GAI-based assistance in writing English helps them feel confident and makes learning English easier in the school year indicating that GAI is really stimulating interest and the belief and desire to learn. In conclusion, the study results show that undergraduate English majors have a highly positive attitude towards the inclusion of GAI into the English writing process and are willing to adopt GAI as part of their writing process. Overall, users appear relatively receptive and willing to adopt GAI in English writing, despite uncertainty on specific applications.

This study provides several valuable details that teachers for those considering the introduction of GAI tools in English writing instruction can draw upon. Firstly, given students' favorable attitudes to GAI-assisted writing, and so by the use of GAI tools, educators can promote students' desire and autonomy while in the process of learning. Secondly, more intensive training and workshops on GAI tools helps educators better orient and apply these skills to guide their students. In addition, GAI also has potential in designing personalized learning pathways according to the various needs of students. However, technicians also should receive feedback from users to continuously enhance or build in interactive and personalization features of GAI tools to align them more with the practical needs of educational facilities. Also, securing GAI tools' usability and reliability is important for educators' and students' seamless integration and use.

While it provides important contributions, this analysis is not without limitations. There are several limitations for the analysis, in particular the sample size, though sufficient for analysis is restricted to undergraduate English majors at a particular university, thereby decreasing generalisability. Second, the study was based on self-reports and was influenced by response bias, that may have been involved. Furthermore, the cross-sectional design of the data collection does not facilitate exploring trends in attitudes over time in the long-term process. A broader, more varied sample would be beneficial in future studies, as students from different disciplines and academic background might be included in the sample. Longitudinal designs could be utilized to examine an attitude change of GAI-assisted writing interventions over time. And could qualitative study methods like interviews or focus groups be used, to gain more detailed details about the students and thus to form a better understanding of their experiences and perceptions.

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