The Use of Artificial Intelligence in English Writing: Experiences and Perceptions of Non-English Major Students in Mainland China

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Abstract	Article Info
Recently, artificial intelligence (AI) has been increasingly used in the field of education to support students learning as new tools have been developed for creating better learning opportunities for the children. Studies have also shown mixed consequences of this type of development as some claim that the use of AI tools reduces students' creativity while others take it as an essential tool for supporting learning of the current and future generation. In China, students studying at university level have been found to have extensively used the AI for writing in English. This paper explores the experiences and perceptions of non-English major students' use of AI in writing in a university in Mainland China. A total of 120 students studying non-major subject at a university were selected using the convenience sample technique and the data were collected through survey and interviews. The survey was drawn on "Theory of Technology Acceptance and Use" that categorized the user experiences into five dimensions: performance expectations, effort expectations, social impact, facilitation and intention to use. The findings showed that the use of AI had a positive impact on the improvement of English writing skills of non-English major university students. The implication of this impact is that their motivation for writing enhanced indicating that the university program might need to consider students' use of AI tools for developing language skills including writing. *Keywords*: AI, English writing, higher education, China	

Introduction

In the 21st Century, human life has largely been impacted by the rapid advancement in science and technology related innovation including cloud computing, artificial intelligence (AI) and other modern information technologies. Education is one of the sectors that has seen tremendous growth in the use of technology with an expectation that increased use of technology improves the quality of learning and teaching. Both teachers and learners aim to use AI tools such as ChatGPT, Copilot, DeepSeek, among others to accomplish their tasks such as preparation for teaching or learning the contents of syllabus. The technological innovation has challenged the traditional learning systems and forced the educational stakeholders to engage more on development and use of digital resources. In recent years, creating a lifelong, information-based

and intelligent education system and building a lifelong learning society have become important issues in promoting human development and the education sector has this responsibility (Poudel & Choi, 2022). It is therefore important to rethink our conventional education practices in the face of the current global growth of technology and the benefits it can provide to make task completion effective and efficient. Technology use in education has now become the indicator of modernization of our education systems (Liu et al., 2022; Moreno et al., 2020). Several countries have developed their plans for technology integration in education. For instance, China Education Modernization 2035, a vision developed in 2019 points out that it is necessary to accelerate the transformation of education in the age of information technology, accelerating the reform of the talent training model by using modern technology, and achieve the organic combination of large-scale education and personalized training. This policy vision reveals that the Chinese government emphasizes the unstoppable expansion of technology in education and social systems and aims to make use of it to the benefit of all concerned to make their life easy, of good quality and relevant to address the need of the changing global marketplace including instructional practice.

Language teaching profession has also witnessed the benefits and challenges occurring out of such expansion of technology for teaching. Almost a decade ago, Liu (2014) pointed out, foreign language education (probably mainly English language education) will undergo fundamental changes due to the emerging trends of technology use. As a result of the changes in the traditional teaching and learning modes, there will be fundamental changes in teachers' and students' perceptions, as well as in the direction and focus of teaching and research. In China, as Zhang (2022) mentioned there is a growing domination of technology in teaching and learning. The context of China is further interesting in the sense that parental readiness is high to adopt any form of technological innovation that can help their children succeed in academics (Fijodo et al., 2021). In this context, the foreign language teaching situation is also facing similar trends, and students are highly engaged in using technology in learning English, whether it be in practicing speaking or writing.

In the context of not achieving the learning goals in terms of English writing by university students, the use of AI could be one of the enabling factors, and therefore is the heightened motivation of students towards using it in English writing. Studies have indicated that use of AI can provide students with personalized learning strategies to improve their writing outcomes in order to better accomplish the learning goals, and at the same time, allowing students to enhance their critical and practical abilities in English writing during the learning process. The development of AI technology has given rise to AI-based writing aids, which provides powerful assistance for English writing. The utilization of these tools by college students can improve the quality of students' essays (Guo et al., 2023), reduce writing anxiety and increase writing motivation (Strobl et al., 2019). Due to these advantages, AI writing aids are highly sought-after by teachers and students. Many foreign language teachers have pointed out that the foreign language writing and translation ability of intelligent systems has surpassed that of the average learner, which to some extent has had an impact and influence on the teaching activities of colleges and universities (Huang, 2022). Therefore, this study explores the college students' experiences in relation to the use of AI in their English writing. More specifically, this study aimed to answer the following research questions.

a)   What are the experiences of students in the application of Artificial Intelligence in English writing at a university in China?

b)   How do educational AI technologies affect their English writing?

Literature Review

Digitalization of education has been a commonly established phenomenon. In today's

context of technological proliferation, the evolution of learning is inextricably entangled with the rapid advancement of digital tools. The use of AI-powered writing instruments in English as a Foreign Language (EFL) classrooms is rapidly increasing, including the use of grammar checkers, writing aids, and programs that can create written work (e.g., essays) without human help (Marzuki et al., 2023). What's more, according to Bhutoria (2022), is that AI-powered platforms and applications provide students with personalized learning opportunities that identify their writing strengths and weaknesses. In this section, we present thematic description of the use of educational AI and current situation of AI use in English writing based on the findings of several previous studies in the field.

Educational Artificial Intelligence

Although AI has been used in all fields of human life and social systems, in this paper we focus on the use of AI in education, therefore educational AI. Dobrev (2015) pointed out that AI would be such a program that in an arbitrary world it would be no less able to cope than a human. In recent years, AI has been combined with various industries and generated different concepts, among which the combination of AI and the field of education has generated concepts such as "Artificial Intelligence Education" or "Educational Artificial Intelligence". The former refers to the learning of AI knowledge and technology as educational content; while the latter suggests the application of AI as an aid in the classroom to support teaching and learning. Several studies have also reported that efficiency in learning has improved due to the expansive use of AI. Educational AI is dedicated to combining AI with education to make students' learning, teachers' teaching, campus management and other aspects smarter for the convenience and quality of education.

In recent years according to numerous scholars (Hosseini et al., 2023; Thorp, 2023), AI writing tools can provide comments on many parts of writing, including grammar, vocabulary, syntax, content and structure, and are designed to analyze written materials. AI can make it possible to get timely and effective feedback on students' writing (Akgun & Greenhow, 2022), thus, students are better capable of getting the assistance provided by AI in time, more instantly than the support they get from their mentors. And this kind of timely feedback is exactly what mainland Chinese students need in their writing. Besides, one example of the educational AI is the emergence of AI-powered digital writing assistants, in which the online tools are being used worldwide in order that the quality of writing of learners can be improved (Al Mahmud, 2023; Zheng & Warschauer, 2017).

Current Situation of College Students' English Writing

For EFL learners, the level of writing proficiency is an important index for judging their academic performance in college (Geiser & Studley, 2001). In China, English has always been regarded as an indispensable second language, especially among students. Chinese students from a young age have to bear the enormous pressure brought about by English education, whether it is the college entrance examination or the College English Test 4 (CET-4) and CET-6, English writing occupies a large proportion, leading to students' gradually anxiety about English writing (Woodrow, 2011). For the past few years, with the advancement of English teaching and educational revolution, the study of English writing has received an increasing amount of attention in mainland China. Chinese university students still need specific focus on strategies that can help them to improve writing in English, as English is their foreign language (Zheng, 2010). For one aspect, the emphasis is on the unity of the structure of the essay, and for another perspective, it is that teachers in mainland China tend to guide students to memorize some sentence patterns or fixed collocations (Dong & Yue, 2015) providing students limited opportunities to write critically. The use of AI could be one of the areas to explore to understand how students have got chance to improve their writing by use

of the machines and the feedback from them. Dong and Yue (2015) reported three common problems of Chinese students in English writing: firstly, Chinese teachers focus on the development of discourse language skills at the expense of the development of discourse skills. The second is that students focus more on grammatical accuracy and neatness of writing, thus neglecting the depth of thought and internal logic of writing content. Third, Chinese university students generally are in need to develop logical thinking and critical thinking skills. To be noted is the fact that there has been a huge change in the teaching and learning system in China in recent years where pedagogical activities aim to promote students self-regulated engagement in learning (Zou, 2023)

In Pakistan's higher education programme, English teaching is strictly limited to four hours per week, let alone the time spent on English writing (Hassan et al., 2020). Similar to China, Pakistani students are also expected to focus on the correct use of words and grammar in their English writing rather than completing a creative piece of writing. In Indonesia, learning English writing is also not an easy task for both teachers and students. English is taught as a second language in Indonesia (Ayu & Indrawati, 2020), and even though students in Indonesia are taught English from primary school onwards, it becomes more difficult to teach English writing in the higher grades due to the teacher's inability to hold the students' attention in the classroom. According to Seyoum et al. (2022), college students in Ethiopia experience some of the same difficulties mentioned above in writing related courses. They are forced to use formal language, grammatical structures and logical evidence in their writing while students' ideas cannot be expressed in a well-organized manner and therefore students are unable to generate satisfactory writing examples.

Studies of AI and College Students' English Writing

AI has been established an emerging technological tool assisting human to simplify their tasks. In the field of education, the introduction of AI has presented both opportunities and challenges. In recent years, extensive research studies have documented the use of AI in college students' language learning endeavours including writing in English.

Drawing on the context of China, Zhang (2020) investigated the teaching design and practice of college English writing. Similarly, Yang (2020) investigated the integration of AI smart classroom construction into the university English writing course, focusing on the research object of China's universities. Changwan et al. (2015) conducted a study entitled "Empirical Research on English Writing Based on Corpus Big Data" exploring the potential of intelligent systems, such as those employed by cool critic.com and the corpus tool Word Smith Tools 6.0, for enhancing English writing, correction, and teaching. They conducted an in-depth analysis of the significance of corpus application in these domains and put forth a series of recommendations for integrating corpus big data into English writing and correction instruction. Additionally, Jing (2023) explored the human-machine symbiotic writing teaching mechanism proposed based on a generative AI-assisted writing teaching model in the context of rapidly developing AI. In a similar vein, Zhang (2023) investigated the construction of the "3113" teaching mode of the English writing course, which is based on digital technology and the combination of qualitative and quantitative research methods. Chen (2024) has also discussed the application of ChatGPT, a representative of artificial intelligence, in the field of foreign language education. Furthermore, she has analyzed the teaching of college English writing with the participation of ChatGPT from the perspective of activity theory.

While foreign scholars in the research related to AI educational application pay more attention to the theoretical level to explore the impact of AI on students' learning behaviour, motivation and learning effectiveness. Additionally, AI has demonstrated distinctive capabilities in the assessment and diagnosis of college students'

writing. Nazari (2021) conducted a randomized controlled experiment to compare the differences in behavioral, affective and cognitive engagement, as well as self-efficacy and academic mood, between students who used AI writing tools and those who did not. The study demonstrated that AI-assisted tools can improve students' psychological state of learning and enhance their self-efficacy and sense of achievement. The results demonstrated that the use of AI-assisted tools effectively enhanced students' behavioral, affective and cognitive engagement, as well as increasing students' writing self-efficacy and positive emotions. Gayed (2022) developed AI KAKU, an AI-based online writing assistant in the field of AI education research, which aims to assist EFL learners in reducing cognitive stress during the writing process and improving the efficiency and quality of English writing. The findings of the study indicated that the AI online writing assistant enabled learners to allocate more resources to complex writing tasks, thereby enhancing their writing efficiency. For the application of AI, Fitria (2023) describes the application of ChatGPT as a representative of AI in the context of English language teaching and student learning. In his study, Fitria examines the use of ChatGPT as a representative of AI in the context of English language teaching and student learning. He assesses its actual efficacy and potential impact on English writing. He highlights the significant potential of ChatGPT in the field of English language teaching and learning. It has the potential to assist students in enhancing their writing abilities and grammatical accuracy, while also serving as a valuable aid for educators in the assessment of assignments and the provision of feedback. Scholars such as Ginting (2023) have delved into the perspectives of students regarding the utilization of artificial intelligence (AI) as a writing aid. Ginting posits that the integration of AI writing tools as an aid can lead to notable improvements in students' writing proficiency and efficiency, while also fostering greater interest and motivation in writing. This further corroborates the extensive acceptance and recognition of AI

writing tools among students, and substantiates the considerable potential for AI technology to emerge as a pivotal pedagogical aid. Similarly, Lee (2024) investigated the utilization of AI writing tools by college students and their perceptions regarding their use in English writing courses. Similarly, both studies highlighted the efficacy and influence of AI tools in enhancing the writing abilities of English learners. The distinction is that Lee mentions that the excessive utilization of AI writing tools in academic writing may influence students' learning styles and perceptions, potentially limiting their opportunities for independent thinking and fostering an increased reliance on AI. Furthermore, Lee emphasizes the importance of personalized teaching, which entails the provision of customized learning resources and personalized feedback based on students' diverse learning styles and progress. This approach is believed to facilitate more effective improvement in students' English writing skills.

In summary, studies the existing research in China and beyond have demonstrated that the use of AI in English teaching has substantial and multifaceted benefits for EFL learners. Although there are limitations in the use of AI, majority studies have shown that students' engagement in English writing was increased and improved over time while they used AI. It provided them with more information, instant access to information which they used for shaping up their writing.

Methodology

Research Context and Design

This research aiming at exploring the experiences of university students on the use of AI in English writing was conducted among students from a university in China. The research problem generates from a situation that the non-English students are often not interested in writing in English and they hesitate to write as expected. The student population was the non-English major, who were all Chinese native speakers. As mentioned previously, the context of the study is of a

technology-enriched higher education institutional context, and most of the students have a high-level technology knowledge and skills. Most of them use AI technology for several purposes including solving their English learning task.

The study used questionnaire and interview methods to collect data from students in the class majoring in Chinese Language. The questionnaire was administered to 120 students among them 9 students (labelled with letter A to I) were selected for interview. Students labelled A, B and C had high-level proficiency, students D, E, F had middle level and students G, H, I had low level English proficiency. The students for interview were selected considering their level of English proficiency categorized as upper, middle and lower level. The interviews were conducted with them before, during, and after their use of AI-assisted writing in English learning. On top of that, the questionnaire was designed based on Theory of Acceptance and Use of Technology, which was developed by scholars Venkatesh et al. (2003). This theory consisted of four dimensions - Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). This theoretical framework has been widely recognized and used by academics and was therefore adopted as the basis for the development of the questionnaire for this study. However, it has been twenty years since the theory was proposed, and the author has added a new dimension - Use Intention (UI) while retaining the above four dimensions based on the purpose of the study. The data from questionnaire were processed through SPSS analysis. The analysis was done in response to the research questions mentioned before and presented in the thematic categories.

Procedure of Data Collection

The study was conducted in an intervention model. It continued for 12 weeks, and with Chinese language major students at a normal university in Huizhou, China. The students and teachers spent four hours each week on learning English writing on the contents pertaining to the course and textbooks. The teacher guided the students to use AI for writing assistance. Questionnaires were administered and interviews were conducted with the students at the end of the course and the results were recorded and statistically analyzed using SPSS statistical software. The first step was to collect quantitative data. Then, qualitative data was collected through interviews with nine participants to determine the students' experience in and impact of the use of AI in English writing.

Results and Discussion

The results of the study have been reported here on the thematic categories, firstly the findings from the quantitative data and later from the qualitative data.

The Quantitative Results
The use of AI-assisted platforms for English writing

Table 1 below presents the use of AI tools in English writing as reported by the students involved in this study. Students were found to have used more than fourteen types of AI writing platforms.

Table 1

AI tools used in English Writing

AI Assisted Writing Platform	Used	Not Used
SentenceCoolCritique.com	5(15.15%)	28(84.85%)
Wisdom Learning	8(24.24%)	25(75.76%)
EFL Essay Evaluator 1.0	5(15.15%)	28(84.85%)
Bingo English Intelligent Composition System	2(6.06%)	31(93.94%)
iWrite2.0	3(9.09%)	30(90.91%)

AI Assisted Writing Platform	Used	Not Used
Joyful Homework	4(12.12%)	29(87.88%)
New Oriental Essay Evaluator	4(12.12%)	29(87.88%)
Baidu Translation Essay Critique	6(18.18%)	27(81.82%)
KU Xunfei Platform	12(36.36%)	21(63.64%)
Baidu AI Platform	16(48.48%)	17(51.52%)
Tencent Cloud Platform	7(21.21%)	26(78.79%)
Rain Classroom	2(6.06%)	31(93.94%)
Homework Help	15(45.45%)	18(54.55%)
Quick Pair	3(9.09%)	30(90.91%)
Others	7(21.21%)	26(78.79%)

The data shows that only one student (3.03%) had never used AI-assisted writing platforms, and the other students (96.97%) had used AI-assisted writing applications. Table 2 shows the degree of adoption of different AI-assisted writing platforms by them. The number of users and non-users of each AI-assisted writing platform are listed in detail, among which the top three most popular AI-assisted writing platforms for students are: Baidu AI Platform, Homework Help and KU Xunfei Platform, with 48.48%, 45.45% and 36.36% users respectively, all three AI-assisted writing platforms have a student where adoption rate of more than 30%.

Impact of AI use on English writing

This study further explored the students' views on the impact of the use of AI tools in their English writing. Table 3 presents the details of the impact reported by the students.

Table 2

User Perceptions of the Impact of AI on English Writing

Dimension	$\overline{X}$	SD
Performance Expectation	3.63	0.89
Effort Expectations	3.69	0.97
Social Impact	3.41	0.92
Convenience	3.49	0.94
Intention to use	3.64	0.86

Table 2 shows the perceptions of the students towards the impact of AI use in their English writing. Five dimensions of writing were affected by AI-assisted writing that includes performance expectation, effort expectation, social influence, facilitating conditions and use intention. As shown above the highest mean scores were found in effort expectations and performance expectation, with corresponding mean values of 3.69 (0.97) and 3.63 (0.89), respectively, indicating that the surveyed students pay more attention to the effectiveness of the output results of the AI-assisted tools and the enhancement of learning efficiency.

Furthermore, Table 3 presents the areas that students have used the AI tools for the purpose of English writing.

Table 3

Application of AI in English Writing

Applications and Demand	Yes	No
Provide more excellent model essays	31(93.94%)	2(6.06%)
Automatically suggest appropriate writing exercises	22(66.67%)	11(33.33%)
Monitor my study status in real time	14(42.42%)	19(57.58%)
Automatically adjust my study plan	14(42.42%)	19(57.58%)
Other	2(6.06%)	31(93.94%)

Table 3 shows the students' applications and demands for the AI tools in English writing, among which the two most popular applications' demands are: provide more excellent model essays and automatically suggest appropriate writing exercises, the corresponding number of students is 31 (93.94) and 22 (66.67) respectively, among which more than 90% of the students need to use AI to provide more excellent model essays, which the students can take as samples. This study also compared the AI use of the students who used AI from multiple platforms and who do not use multi-platforms. Table 4 illustrates this comparison.

Table 4

Comparison of Not Multi-Platform and Multi-Platform Users' Perceptions on the Impact of AI on English Writing

Dimension	Not Multi-platform-$\overline{X}$	Not Multi-platform - S.D.	Multi-platform -$\overline{X}$	Multi-platform-S.D.	
Performance Expectation	3.66	0.65	3.58	1.2	t .266
Effort Expectations	3.86	0.68	3.42	1.28	t .1.29
Social Impact	3.41	0.71	3.4	1.2	t .026
Convenience	3.6	0.75	3.33	1.19	t .811
Intention to use	3.69	0.7	3.56	1.1	t .416
	a = .05				
	t(.05,df =31) = 1.696				

In this study, the students who used more than 2 platforms or more AI aids were defined as Multi-Platform Users, and those with 2 or less platforms were defined as Not Multi-Platform Users, based on the results of the independent samples t-tests, which showed that Performance Expectation, Effort Expectation, Social Influence, Facilitating Conditions and Use Intention t-statistics were 0.266, 1.29, 0.026, 0.811, and 0.416 (p>0.05), respectively, and the difference in the number of platforms used was not significant in any of the five dimensions, but Multi -Platform Users scored slightly higher than Not Multi-Platform Users in all five dimensions suggesting that cross-platform use enhances respondents' positive attitudes towards AI-assisted writing.

In a nutshell, based on the results of SPSS analysis, the study shows that the vast majority of the students used AI-assisted writing apps at a high percentage, with Baidu AI Platform, Homework Help and KU Xunfei Platform as the main choices. In English writing, the features that students need most are the provision of better model texts and automatic suggestions for appropriate writing exercises. In addition, students generally agreed that AI-assisted writing tools played an important

role in improving the efficiency of writing and the validity of output results. In summary, the results of this study provide insights into the use of AI-assisted writing applications and provide useful references for further research and development of AI in education.

Qualitative Results

The Interviews were conducted with the selected students and this section provides a brief analysis of the data obtained from them. The first section of interview describes the current state and experiences of English writing among non-English majors. To begin with, according to the interview data, the interviewees, regardless of their writing level, agreed that the main factors affecting their English writing level were syntax and vocabulary. This is one of the major problems of Chinese students, studying for exams leads to the writing without depth. However, low proficiency level students felt that their problems also arose from a lack of originality in the framing of the essay and the entry point of the essay. "*I don't think my essay has any misuse of language, but it lacks advanced vocabulary and original ideas*"(H-1). That is to say, for low-level students, their problems appear not only in the accumulation of vocabulary and sentence patterns, but more importantly in the coherence of the whole text. When asking for the solution, most interviewees regarded that accumulating more vocabulary and sentence patterns will solve the problem. However, "*I've tried to memorize the model writings, but with little success*" (G-1), which shows that rote memorization is not a good way to improve English writing either. Overall, problems with the current state of English writing among the interviewees were prevalent in vocabulary and grammar, while the problems of the lower intermediate level students were also reflected in the poor coherence of the whole text. The follow section will be conducted with the interviewers on five dimensions and further explore the impact of AI-assisted writing tools on students' perceptions as well as writing skills.

Under the guidance of the teacher, students began to use AI-assisted writing for the first time, but generally gave a less than satisfactory experience with it. "The AI gives so much information that it's hard to summarize it yourself" (A-1), besides, "Inability to accurately communicate instructions and lack of fit" (C-1). For the lower-middle level students, who have limited proficiency, showing difficulty in understanding what the AI produces. "The AI-generated articles are at a higher level and I sometimes can't understand them" (E-1). The following are the common areas that the students believed have improved out of the use of AI in English writing. Most of these dimensions were also reported by students in the survey questionnaire as well.

Performance Expectation

Analyzed from the perspective of performance, AI-assisted writing has a positive feedback effect on both students' interest in writing and writing proficiency to a certain extent. "AI-assisted writing is very responsive and can give me a view of my writing in a short period of time, effectively helping me to complete my writing" (B-2). "AI teaches me logic and design of ideas, and also provides examples and points out my grammatical errors" (D-2). For students with a weak foundation, "Now I will try to mimic the full article generated by the AI to see where I fell short before and slowly absorb and transform it into my own content" (G-2). When asked whether AI increased students' interest in writing, the interviewers' own confidence and interest in writing gradually increased. "I've always been confident and interested in writing, and I enjoy the sense of achievement that comes from getting better as I build up my writing" (B-3). There is no doubt that AI-assisted writing is positive feedback for upper-middle class students' writing, what's more, for the lower level students, AI assisted writing to a certain extent can enhance their writing ability and confidence as well. "I used to be narrowly conceived, but now I've learnt to think critically, and my English writing has gradually gone from being resistant to now itch to try!" (I-3). In a word, AI-assisted writing in PE for upper students allows

them to refine their writing. For lower-middle level students, AI-generated essays are worth learning both in terms of structure and syntactic vocabulary, which can then be gradually transformed into their own knowledge.

Effort Expectation

Here comes the perspective of effort and expectations of the students and the study found that students generally struggled with using AI as a writing aid in the beginning, but after consistent use students slowly began to use it with facility. "The AI gives more information and it's a bit hard to summarize it" (C-1). The problem is also that students don't know how to use AI, "I can't use the search engine very well, and it's a bit difficult to get the instructions across" (D-1). And for lower level students, they sometimes can't read the articles generated by the AI, "The AI-generated articles are at a higher level and I sometimes can't understand them" (E-1). However, after the teacher guided the students to use AI-assisted writing for some time, the students began to gradually adapt and become proficient in using AI writing. "After using AI-assisted writing for a while, I can find the entry point more quickly, and the more I accumulate a lot of advanced vocabulary sentence patterns" (A-2). Mid-level students also felt that AI provided a positive impact on their writing, "The AI will not only give me ideas but also correct my grammatical errors" (F-2). For students with a weak writing foundation, AI is a significant improvement for them. "AI has provided me with a number of ideas to broaden my horizons and enrich my writing" (H-2). Overall, inevitably, when students were new to AI, they were not proficient, and after using it for a period, the students' writing improved noticeably. First of all, for the superior students, AI-assisted writing can help them maintain a high standard. The intermediate students were able to significantly reduce their grammatical errors and their lines were more fluent. Weak students can learn novel ideas and good sentence patterns from the articles generated by AI, thus accumulating more writing materials.

Social Influence

Next comes to the angle of social influence. When asked about the attitudes of those around them toward the application of AI-assisted writing to students, the majority of interviewees received support from their families. "My parents were very supportive when they heard about it and thought it would be good for me to keep my interest in learning high" (C-2). There were also a small number of students who said their parents were against it. "My parents and close friends believe that what is on the Internet is never real, and that the only way to learn is to learn it for yourself, and not to rely too much on the Internet" (H-2). It follows that when the use of AI-assisted writing can be supported by those around them, the use of students can also have a positive impact.

Facilitating Conditions

The interview questions in this section explore the facilitating conditions aspect of AI-assisted writing. All interviewees reported that teacher provided them with aids during their orientation to AI-assisted writing. "In the beginning, when I was not familiar with search engines, the teacher's class gradually guided us on how to use AI correctly" (B-3, F-3). Teacher guidance is also an important condition to increase students' motivation to use AI in their English writing. "When I first started to use AI, the commands were incorrect and the AI could not give me the answers I wanted, but I gradually learnt to communicate with the AI with the help of my teacher" (H-3). Therefore, the teacher's guidance plays a crucial role in the use of a new learning tool, not only to solve the students in contact with new things is the resistance, but also to improve students' enthusiasm in learning an effective way.

Use Intention

Last but not least, is students' Use Intention about AI-assisted writing. The majority of interviewees illustrated that they would continue to trial AI-assisted writing, while a small number felt that AI had some limitations. "After using AI-assisted writing for a period of time, I can clearly feel the convenience that AI has brought to me,

and I can also clearly feel that my writing level and interest have been improved" (A-3). Overall, based on five dimensions, providing multiple perspectives for analyzing students' experiences and perceptions when using AI-assisted writing tools, revealing differences in acceptance of the tools and motivation to use them at different levels.

Discussion

The purpose of this study was to determine if and to what extent the AI-assisted writing tool affected participants' academic writing in English. The findings of this study indicate that AI-assisted writing tools have a multifaceted impact on students' academic writing, especially on the improvement towards English writing. The high-level students perceived AI tools as overwhelming due to the abundance of information they provided. However, intermediate-level students experienced improvements in writing quality and interest, while lower-level students found AI-generated essays beneficial as models for learning. These outcomes align with findings by Parra and Calero (2019), who demonstrated AI's capacity to provide in-depth assessments and feedback on grammar and coherence, thus aiding students in identifying and addressing deficiencies. Social influence played a significant role in shaping students' attitudes toward AI-assisted writing. Support from teachers and peers encouraged students to embrace AI tools, enhancing their motivation and engagement. The importance of social support is echoed by Rad et al. (2019), who emphasized the integration of AI with educational technologies to create supportive and personalized learning environments. Facilitation Conditions, such as the availability of teacher guidance, were crucial for students' successful adaptation to AI tools. Teachers' support helped mitigate initial resistance and fostered students' enthusiasm for using AI in writing. This finding supports Xia et al.'s (2023) assertion that AI tools can significantly boost students' interest and learning outcomes when properly integrated into the curriculum. In the aspect of use intention, most students expressed a willingness to continue using AI-assisted writing tools, citing improvements in writing quality and increased interest as key factors. However, a minority voiced concerns about AI's limitations, reflecting Hegelheimer and Lee's (2013) findings that AI systems can enhance motivation and self-confidence but may not fully replace human input in writing instruction. Similar findings have also been reported by several studies. For instance, the students who accepted technology as a tool for learning they did more progress in English learning, including the development of English language skills (Lee & Meng, 2023).

Conclusion

This study concludes that the use of AI, especially the educational applications of AI were useful in the improvement of their English writing. Though the students were facing problems pertaining to their academic vocabulary and grammar, their frequent use of several AI tools supported them learn better, write with higher level motivation and efficiency. These findings from the research provides valuable insights into the potential and challenges of AI-assisted learning in the realm of English writing. Due to these benefits, the students were found to have a positive attitude towards the use of educational AI in English writing and thought that it is helpful to them in many ways. Although most students think that it is easier to use educational AI in English writing, there are still many problems in the actual use of educational AI, which can be solved with the help of themselves, their classmates, their teachers, and the Internet.

The study's findings suggest several implications for future instructional processed of English in non-English major learning classroom and EFL context in general. First, instructors should provide structured guidance to help students navigate AI tools effectively. Second, educators should tailor AI-assisted writing activities to students' proficiency levels to maximize benefits. Finally, fostering a supportive learning environment that encourages experimentation with AI tools can enhance students' writing skills and confidence. The utilization of AI technologies in education is driven by the need to enhance learning experiences, personalize education, and improve

learning outcomes. Although this study did not measure the learning outcomes in quantitative terms, the perceptions reported by the students indicate their perceived impact of the use of AI in improving the achievement.

This study had several limitations. The limitations include a small sample size and focus on non-English majors, which may limit the generalizability of the findings. Future research should explore the long-term effects of AI-assisted writing on diverse student populations and investigate how AI tools can be optimized to address individual learners' needs. Additionally, examining the integration of AI tools across different disciplines could provide insights into their broader educational impact.

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