A Mixed-Methods Study of AI-Assisted English Reading among English Majors from the Perspective of the Technology Acceptance Model

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Abstract. Generative artificial intelligence (hereinafter referred to as AI) is rapidly penetrating the field of higher education and has been widely applied in multiple facets of foreign language learning, bringing about profound transformations in English reading learning. Focusing on English majors in higher education institutions as the core population, this study is constructed upon the Technology Acceptance Model (TAM) and employs a mixed-methods research design combining "questionnaires and interviews," aiming to investigate the practical effects of AI-assisted English reading from multiple dimensions, including perceived usefulness, perceived ease of use, and behavioral intention to use. The study ultimately obtained a research sample consisting of 37 questionnaires and 3 interviews. The results indicate that the majority of students frequently use AI to assist their reading and do not encounter significant difficulties in AI usage; however, some students believe that AI still exhibits factual errors and that users are prone to developing dependence on AI, indicating certain reservations regarding the actual use of AI.

Keywords: Artificial intelligence; Technology Acceptance Model; English reading; mixed-methods research.

1. Introduction

In recent years, generative artificial intelligence tools represented by ChatGPT and DeepSeek have rapidly penetrated the field of higher education and have been widely employed by teachers and students in various stages, including pre-class preparation and post-class extension, profoundly transforming the learning approaches of foreign language reading. However, existing research on AI tools in English reading contexts has paid insufficient attention to learners' subjective experiences and application behaviors, lacking in-depth examination of the process-oriented questions of "how frequently students use AI, why they use it, and what attitudes they hold." Contemporary society imposes increasingly higher demands on English majors in terms of the high-level professionalism of their language and translation logic as well as their comprehensive cultural critical thinking abilities, and the emergence of AI translation may potentially undermine the attainment of these demands. Against this backdrop, the present study focuses on English majors in higher education institutions as the core population, adopts a mixed-methods research design combining "questionnaires and interviews," and constructs its questionnaire based on the Technology Acceptance Model (TAM). It aims to systematically investigate English majors' actual application experiences with AI tools as well as their attitudes toward and evaluations of AI use, to trace the underlying causes, to supplement the field of research on learners' micro-level processes with additional empirical evidence, and to provide more in-depth practical implications for AI-empowered foreign language learning.

2. Literature Review

2.1. Research on AI and English Reading

The penetration of AI technology into the field of education has been increasingly deepening, and existing studies indicate that it plays an important role in English reading. Gu Haibo and Qiao Ruoxue

(2024) pointed out that "contemporary artificial intelligence technology is profoundly influencing the ecological environment of foreign language education, and foreign language teachers urgently need to enhance their ability to use artificial intelligence for English teaching" [1] This article indicating that artificial intelligence has genuinely become one of the indispensable auxiliary tools for education and learning in higher education environments. Phalla Chea and Yangtian Xiao (2024) demonstrated through an experiment that AI-assisted English reading can indeed help students improve their English reading skills and thereby achieve better academic performance; however, the experiment also noted that AI-assisted learning has certain shortcomings, primarily manifested in over-reliance on AI and related ethical issues. [2] Ling Hui (2025), through an analysis of AI technology in junior secondary school English reading, argued that AI technology should be further utilized to enhance the reading experience, ultimately achieving the integration of "teaching-learning-assessment." [3] Existing research generally acknowledges the auxiliary efficacy of AI in English reading; however, over-reliance may lead to intellectual inertia, and research has predominantly concentrated on the basic education stage, with investigations into AI application among English majors in higher education remaining relatively insufficient. Current international research has mostly focused on the advantages and disadvantages of AI applications, while domestic research has tended to explore the possibilities of AI-empowered instruction. Nevertheless, research findings have largely concentrated on basic education or English language teaching, and have mostly adopted research methods such as controlled experimental analysis and literature review analysis, with relatively few employing mixed methods to investigate English majors' acceptance processes and subjective experiential feedback regarding AI-assisted English reading applications.

2.2. Application of the Technology Acceptance Model in Educational Technology

The Technology Acceptance Model (TAM) was proposed by Fred Davis in 1989, with its core components including Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), which are used to explain users' acceptance behaviors toward a given information technology. Davis posited that PU and PEOU jointly determine users' attitudes and behavioral intentions.[4] Xu Jinfen and Deng Qiaoling (2024) stated: "In the field of education, TAM has been used to explain the use of different technologies in language teaching... A large number of studies have confirmed that the model has strong explanatory power.".[5] Therefore, in the field of education, TAM has been widely used to assess teachers' and students' acceptance of technologies such as online learning platforms and intelligent tutoring systems. For example, Cai Yan and Wang Ze (2022) introduced the Technology Acceptance Model (TAM) into the field of international Chinese language education research and constructed a theoretical model to explain and predict Chinese learners' willingness to learn through online live-streaming courses. [6] These studies all indicate that TAM provides a reasonable and robust theoretical framework for understanding educational technology acceptance. However, this theoretical model has mostly been applied to research on online platform applications and surveys of online course satisfaction, whereas AI-assisted English reading constitutes an AI-empowered learning tool whose characteristics and user needs differ from those of general online teaching platforms; therefore, separate verification of PU and PEOU in this specific context is required.

2.3. Research Gaps and Positioning of the Present Study

In summary, existing research has accumulated substantial findings regarding the effectiveness of AI in reading instruction and the application of TAM; however, viewed comprehensively, there remains room for further expansion: First, research on the process of AI-assisted English reading has mostly focused on language disciplines or basic education, and research on students' specific experiences and feedback during use warrants further in-depth exploration. Second, although TAM research has addressed online teaching, AI tools have rarely been taken as the specific technological research object to explore their actual application effects in disciplinary reading contexts. Third, research methods have been relatively homogeneous, with insufficient application of mixed experimental methods combining quantitative and qualitative approaches. Therefore, the present

study will adopt the Technology Acceptance Model as its theoretical framework, focus on the micro-level usage experiences of AI-assisted English reading among English majors, and investigate the effects of perceived usefulness, perceived ease of use, and disciplinary background on usage satisfaction and continuance intention, with the aim of providing further empirical evidence for the subsequent design and promotion of AI educational tools.

3. Research Design

3.1. Research Methods

The present study adopts a mixed-methods research design, following a "quantitative-first, qualitative-second" research sequence. First, questionnaires were distributed to collect feedback from English majors on AI-assisted English reading. The questionnaire was primarily designed around multiple dimensions, including perceived usefulness, perceived ease of use, frequency and attitudes of use, and subsequent willingness to use. After completing the analysis of the quantitative questionnaire data, semi-structured interviews were conducted to further reveal contradictory results or anomalies that might emerge from the statistical findings and to explore the underlying causes. This design, while ensuring the breadth of the data, compensates for the limitations of purely quantitative research and provides more comprehensive and reliable support for the research conclusions.

3.2. Research Participants

The participants of this study were undergraduate students from freshman to senior year in the English major at a domestic university, all of whom possessed the awareness and ability to use basic AI tools. For the quantitative questionnaire, a convenience sampling strategy was adopted, with target valid samples collected primarily through online distribution, with an expected number of approximately 30–40. For the qualitative interviews, a purposive sampling strategy was adopted, selecting from participants who indicated willingness to be interviewed in the final item of the questionnaire. The original plan was to select 7–8 interviewees; however, due to the limited number of respondents actually willing to participate in interviews, the sampling criteria comprehensively considered three categories—frequent users, infrequent users, and those with contradictory attitudes—and representative respondents were selected for in-depth interviews.

3.3. Research Instruments

3.3.1. Questionnaire

The questionnaire was primarily composed of six measurement dimensions: basic information collection (Items 1–4), perceived usefulness (Items 5–8), perceived ease of use (Items 9–10), frequency of use (Item 11), attitudes toward use and feedback (Items 12–13), and willingness to use (Item 14). Item 5 of the questionnaire was originally intended to differentiate AI usage behaviors across different reading stages; however, due to a questionnaire system error that resulted in a large amount of missing responses, this item was excluded from data analysis.

The TAM scale employed in this study was adapted from the Technology Acceptance Model proposed by Fred Davis (1989), covering core dimensions such as perceived usefulness, perceived ease of use, attitudes toward use, and behavioral intention, and was measured using a five-point Likert scale to support subsequent statistical analysis. However, due to sample size limitations, formal reliability and validity testing was not conducted; therefore, only localized item adaptation was performed.

Self-developed items involved the collection of basic information, specific usage scenarios and frequency, and the participants' perceptions of the existing shortcomings of AI, intended to refine the questionnaire structure and expand the breadth of the research content.

3.3.2. Interviews

The interview guide was primarily developed based on the theme of AI-assisted English reading and the dimensions of the TAM model. Its core themes included: follow-up inquiries regarding contradictory results in the questionnaire, participants' comprehensive feedback on perceived usefulness and perceived ease of use, subjective attitudinal feedback on AI-assisted English reading, and intentions for future AI use.

Each interview lasted approximately 10 minutes. All interviews were conducted in the form of online Chinese interviews and were audio-recorded. Participants were informed in advance and voluntarily consented to the recording, thereby ensuring the completeness of the interview data and ethical compliance.

3.4. Data Collection Procedure

Phase One: After the questionnaire design was completed, it was distributed. Upon collection, a secondary review was conducted to eliminate invalid questionnaires, such as those completed carelessly, with excessively short response times, or with regular repetitive responses, thereby ensuring the relative validity of the questionnaire returns.

Phase Two: By setting an optional item at the end of the questionnaire, interview participants were selected from among those who volunteered to be interviewed, with multiple factors comprehensively considered during the screening process.

During the interviews, full Chinese audio recording was conducted, with each session lasting approximately 10 minutes. The recorded content was documented through verbatim transcription to facilitate subsequent in-depth analysis.

4. Research Results

4.1. Demographic Characteristics of the Sample and the Current Status of AI Usage Behaviors

4.1.1. Demographic Information of the Sample

After the questionnaires were distributed, 37 valid responses were collected. The research participants were primarily undergraduate students majoring in English at domestic higher education institutions. Based on convenience sampling, the research results are representative only of the sample in this survey and cannot be generalized to the entire population of English majors at the undergraduate level.

Table 1. Demographic Characteristics.

Item	Category	Number of People	Percentage
Grade	Freshman	23	62.2%
	Sophomore	1	2.7%
	Junior	13	35.1%
	Senior	0	0%
Gender	Male	5	13.5%
	Female	32	86.5%
Frequency of AI Use	Multiple times a day	17	46.0%
	1-2 times a day	12	32.4%
	3-4 times a week	5	13.5%
	3-4 times a month	2	5.4%
	Rarely use	1	2.7%

Among them, freshmen accounted for the highest proportion, followed by juniors; female respondents constituted the overwhelming majority; sophomores, seniors, and male respondents were relatively few. Therefore, the present sample exhibits certain limitations in terms of grade distribution, and generalizations should be made with caution.

As can be seen from Table 1, those who used AI tools multiple times per day accounted for the highest proportion at 46.0%, approaching half of the sample; whereas those who used AI 3–4 times per month and those who hardly used AI constituted a minority, accounting for only 5.4% and 2.7% respectively. It can thus be concluded that the penetration rate of AI usage among the sampled students was relatively high.

4.1.2. Students' Behaviors in Using AI-Assisted English Reading

As can be seen from Item 4, 31 respondents had prior experience of using AI-assisted English reading, accounting for 83.8%. In the past month, 6 respondents had used AI-assisted English reading more than 9 times, accounting for 19.4%; 7 respondents had used it 6–8 times, accounting for 22.6%; the largest proportion, 12 respondents, had used it 3–5 times, accounting for 38.7%; and 6 respondents had used it 0–2 times, accounting for 19.4%, equal to the proportion of those who had used it more than 9 times. Detailed statistical data are presented in Table 2.

Among them, although the majority of students reported having been exposed to AI, substantial disparities existed in actual usage: some frequently used AI to assist their English reading, whereas others rarely used AI for this purpose.

Table 2. Distribution of AI-Assisted English Reading Behaviors.

Item	Category	Number of People	Percentage
Used AI to assist in English reading	Yes	31	83.8%
	No	6	16.2%
Frequency of using AI to assist in English reading in the past month	9 times or more	6	19.4%
	6-8 times	7	22.6%
	3-5 times	12	38.7%
	0-2 times	6	19.4%

4.2. Students' Attitude Levels toward AI-Assisted English Reading

The research participants were the 31 students who had used AI to assist their English reading. Through a questionnaire designed by adapting the TAM model and scored using a five-point Likert scale, with 1 indicating strong disagreement, 5 indicating strong agreement, and 3 indicating a neutral attitude.The students' attitudes toward AI-assisted English reading were quantified and presented in graphical form, yielding Table 3.

Table 3. Mean (M) and Standard Deviation (SD) of Items on Each Scale.

Item	Strongly Agree (5 pts)	Agree (4 pts)	Neutral (3 pts)	Disagree (2 pts)	Strongly Disagree (1 pt)	Mean (M)	Standard Deviation (SD)
English reading speed	13	13	5	0	0	4.3	0.7
Depth of comprehension	10	10	9	2	0	3.9	0.9
Grades and confidence	9	9	11	1	1	3.8	1.0
Ease of use	13	10	8	0	0	4.2	0.8
Feel nervous / Unable to operate	3	4	6	11	7	2.5	1.2
Overall experience	5	15	10	1	0	3.8	0.8

Based on the data results, respondents generally rated the perceived usefulness of AI-assisted English reading highest in terms of improving reading speed, whereas their agreement with its role in enhancing academic performance and self-confidence was relatively lower. At the level of perceived ease of use, students generally considered AI to be relatively easy to operate with clear

instructions, encountering fewer operational and application-level problems during use, experiencing less practical operational pressure, and being able to promptly contact customer service to resolve technical difficulties when they arose. Overall, the sample group held a positive attitude toward AI-assisted English reading.

4.3. Existing Problems in AI-Assisted English Reading as Perceived by Students

In the process of using AI-assisted English reading, students became aware of various shortcomings of AI. As shown in Table 4, the highest proportion, 77.4%, believed that excessive use of AI easily leads to dependence and reduces people's capacity for independent thinking. This was followed by the view that AI translation is rigid and lacks specific contextual grounding, accounting for 64.5%. Those who believed that AI cannot provide in-depth reading guidance accounted for 38.7%; those who believed that AI contains certain factual errors accounted for 25.8%. The least represented concern was about data privacy and ethics, at only 6.5%.

Table 4. Students' Perceived Shortcomings of AI-Assisted English Reading.

Item	Number of People	Percentage
Stiff translation	20	64.5%
Causing over-reliance,	24	77.4%
Contains factual errors	8	25.8%
Unable to provide in-depth reading guidance	12	38.7%
Data privacy and ethical concerns	2	6.5%
Other	2	6.5%

Overall, while acknowledging the value of AI-assisted English reading, most students were able to rationally recognize its practical limitations and potential drawbacks. Due to missing data for Item 5, this study was unable to further analyze in detail the actual situations of students' use of AI across various stages of English reading.

4.4. Core Contradictions and Analysis

For this round of interviews, three representative students were selected according to three categories: those who frequently use AI to assist their English reading (S1), those who find AI convenient to use but do not frequently employ it for assisting English reading (S2), and those who use AI relatively infrequently (S3). The qualitative interview results indicate that the interviewed English majors generally held a positive and accepting attitude toward AI-assisted English reading, acknowledging its practical value in improving reading efficiency, extracting key information content, and assisting vocabulary learning and comprehension. At the same time, students were clearly aware of the practical limitations of AI, would engage in self-restraint behaviors, and consciously reduced the frequency of AI use.

Interviewee S1 considered the convenience of AI-assisted English reading to be mainly reflected in its ability to quickly capture key vocabulary in texts and interpret paragraph main ideas, helping to complete required reading tasks within a short period of time. Interviewee S2 believed that AI could upload text content by taking photographs, automatically organizing unfamiliar and difficult words, thereby greatly saving students' time and energy. The usage scenarios were mostly concentrated in pre-class preparation and post-class review, with essentially no use during class.

When asked about existing shortcomings and usage limitations, the three interviewees jointly identified the following issues:

1. Rigid translation, lacking the vividness and liveliness of human translation, and failing to effectively integrate context and text for comparative translation;

2. Insufficient information accuracy, with the presence of factual errors and incomplete information;

3. A phenomenon of declining translation quality after repeated operations by AI—for example, after multiple instances of photograph-based previewing, AI would automatically truncate the main body of the translated content;

4. Some AI tools impose restrictions on the number of free uses, affecting subsequent continued use;

5. Limitations in passive response behavior—AI can only mechanically provide superficial answers to questions raised by users and cannot proactively offer in-depth interpretation of what users do not understand; users must subsequently ask detailed follow-up questions to obtain complete answers, which places certain demands on users' questioning abilities;

6. A tendency to induce anxiety—because AI translates quickly and corrects errors accurately, some students develop a sense of anxiety about being "unable to match it," worrying about their future prospects, which in turn undermines their self-confidence.

Interviewees generally possessed a certain awareness of dependence prevention. Interviewee S1 candidly admitted a lack of restraint in initial use, later recognized the problem of over-reliance, and had since proactively reduced usage frequency, resorting to AI to save time costs only when tasks were heavy, prioritizing independent attempts to address problems encountered when possible, and collecting materials through other knowledge acquisition channels such as CNKI and library databases to maintain independent thinking abilities.

Interviewee S3 stated in the interview that because other prior commitments had been excessively heavy and had encroached upon study time, not much energy had been devoted to learning English reading, and expressed in the interview that he/she had recognized the important role AI plays in assisting English reading and would consider proactively increasing usage frequency in the future.

Based on the interview investigation, English majors basically acknowledge the convenience and value of AI-assisted English reading, but remain alert to its accuracy, dependence-inducing potential, and potential psychological effects, and tend to position AI as an auxiliary tool rather than simply relying on AI to replace personal thinking.

5. Interpretation and Conclusion

5.1. Summary of Main Findings and Comprehensive Interpretation of the Current Usage Status of AI-Assisted Reading among English Majors

Based on the data obtained from the study, some students used AI to assist their English reading at a relatively high frequency in daily life, reaching 6 times or more per month, and mainly applied it in the stages of pre-class preparation and post-class review. The qualitative interview results indicate that some students believed AI still had certain drawbacks and therefore consciously controlled their own frequency of AI use; some students, because they needed to allocate time and energy to other learning tasks, used AI less frequently to assist their English reading.

Synthesizing the above analysis, the conclusions of the present study are consistent with the viewpoints of Gu Haibo and Qiao Ruoxue's earlier research, namely that contemporary artificial intelligence technology has profoundly influenced the learning of English majors, and AI has genuinely become one of the indispensable auxiliary tools in the higher education environment.

5.2. The Contradictory Dilemma of Students' Use of AI-Assisted English Reading and Its Educational Implications

Students generally acknowledged the practical help and tremendous improvement that AI, as an auxiliary tool, brings to English reading, but at the same time expressed concerns about potential drawbacks such as AI dependence, factual errors occurring during the assistance process, and potential risks to academic integrity.

Based on the above findings, the present study derives the following implications:

Teachers play a crucial role in guiding students to use AI correctly. As 64.5% of students believed that AI translation is rigid and lacks contextual grounding, teachers should encourage students to consciously revise AI output against the original text while using AI to assist their English reading,

so as to avoid deviations in understanding the meaning of the original text as much as possible. As 25.8% of students believed that AI translation contains factual errors, teachers need to teach students how to use professional search engines to verify the information provided by AI, discern the authenticity of the information given by AI, and optimize students' processes and modes of AI use. In addition, in response to the issue raised by 77.4% of students that AI easily leads to dependence and reduces independent thinking, teachers should explicitly inform students of the harms caused by over-reliance on AI and the problems that may arise during use, thereby serving a warning and reminding function.

Students need to establish a "human-machine collaboration" mindset, cultivate a rational understanding of AI as a tool in the process of using AI for assisted reading of English texts, and clearly distinguish between using AI translation for textual reference and wholly trusting AI. They should ensure the development of their text analysis and translation abilities as well as critical thinking, and reduce their dependence on AI.

At the institutional level, universities should improve institutional regulations and the construction of academic ethics, delineate boundaries and norms for AI use by specifying concrete AI-related provisions, strengthen process review, and improve academic integrity standards in the AI era.

5.3. Research Limitations and Prospects for Future Research

Although the present study has yielded certain findings, the following limitations remain:

The samples selected were only English majors from a limited number of higher education institutions; the sample size was relatively small, and there existed problems of uneven distribution in terms of grade and gender, resulting in limited representativeness. The interview sample size was small, and the views obtained represent only some interviewees, making it difficult to fully represent the perceptions of the entire group; the conclusions drawn should therefore be generalized with caution.

The questionnaire distribution constituted a cross-sectional survey, capturing only students' situations of using AI to assist their English reading at a single point in time, and failing to conduct long-term dynamic tracking of subsequent changes in students' attitudes and behaviors, thus lacking a certain degree of continuity.

The present study adopted the basic TAM model and did not systematically incorporate extended variables such as perceived risk and teacher and peer influence, nor did it conduct in-depth research on complex learning environments.

Therefore, in response to the above limitations, the following directions for improvement may be considered in future research:

First, expand the sample size to cover English or foreign language majors in institutions of different tiers and different regions, and conduct further comparative research on differences.

Second, conduct in-depth optimization and adjustment of the model used, incorporate variables such as risk perception and teacher support into the TAM model, and construct a revised model adapted to AI-assisted English reading.

Third, consider introducing longitudinal tracking research methods to continuously observe the dynamic changes in students' actual behaviors and attitudes over time.

Finally, integrate research with practice by conducting classroom teaching intervention experiments, and through controlled experiments comparing groups using AI and those not using AI, examine the actual effects of AI-assisted English reading in the process of instructional guidance as well as its impact on students' learning efficiency and experience.

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