

# Artificial Intelligence in Higher Education: The Power and Damage of AI-assisted Tools on Academic English Reading Skills

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## ABSTRACT

The research explores the impact of AI-assisted tools on academic English reading skills in the classroom and personalized learning among university students regarding how AI tools complement students' assessments. To conduct this research, 24 students were divided into two groups of equal size: a control and an experimental group, which will be involved in an experimental study: one group using solely conventional methods and another group using AI-assisted tools in addition to conventional methods. The goal is to gain evidence on the effectiveness of AI-powered tools in enhancing reading comprehension, vocabulary acquisition, and critical thinking while identifying potential damage, such as overreliance on AI and ethical implications. It employed a mixed-methods approach, which involved an experimental study, survey, and semi-structured interview with students who either have or have not utilized AI for English reading learning. In the experimental research, pre- and post-tests were used to compare the differences in English academic reading scores between two groups of students. The survey was used to determine the students' opinions on the effectiveness of AI tools, and individual semi-structured interviews were employed to obtain more detailed information. The findings posit that the involvement of AI tools in facilitating traditional teaching and learning methods has a more significant positive effect on improving academic English reading skills in educational settings, offering better convenience and effectiveness for students. However, challenges such as overreliance on AI and ethical implications were emphasized. The research provides invaluable insights into the potential benefits and challenges of evolving AI tools to enhance higher education English reading skills in educational settings.

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## 1. INTRODUCTION

Artificial intelligence (AI) has emerged as a field of educational technology with digital applications in education [1], [2]. And due to the COVID-19 pandemic, these brand-

new digital teaching/learning styles have potentially emerged and popularised in the global village [3]. In this way, it has reshaped conventional methods of instruction, capturing attention in higher education and promoting academic English language learning, with app developers and educators actively leveraging AI-powered capabilities. Consequently, AI has appeared and altered English teaching and learning by organizing scientific content, contributing diverse learning sources, and offering personalized tutoring. It assists learners in practicing English skills but still challenges accessing academic resources [4]. Hence, critical issues must be resolved before fully integrating AI into education, even though AI has excellent potential if integrated into the educational process [5].

With the rise of interest in AI in education, few studies have addressed the concerns of AI utilization in higher education [6], [7], [8]. It is important to consider the integration of AI when developing instructional designs and personalized learning in academic English reading. This includes understanding the benefits of using AI with appropriate methods to achieve optimal learning outcomes based on theories, teaching experience, and pedagogical practices to understand AI's role in education systems comprehensively.

Despite the worldwide popularity and influence of AI in higher education, the effectiveness of AI-assisted tools among academic English language learners in improving reading skills, such as comprehension, vocabulary acquisition, and critical thinking, has not yet been fully explored. Our research plays a crucial role in providing a clear understanding of the benefits and challenges of AI-assisted tools, and the study results are essential for educators and learners in contributing to the role of AI in English language learning, particularly academic English reading skills. This will help us understand how to use AI to enhance language proficiency suitably and gain insights into the potential of AI in higher education.

In addition, the literature on this topic, as will be seen in the next section, is limited so far. However, it includes research from various countries where AI in higher education has been implemented to diverse degrees. Furthermore, those studies on AI in higher education do not discuss in detail the efficacy of AI-assisted tools in enhancing academic English reading skills, which prevents a clear picture of the extent to which their use of AI-assisted tools is superficial or based on a thorough knowledge of their effectiveness.

To bridge this gap, this study will examine how effective AI is in improving English reading skills in two groups of students taking two different courses, as well as how they perceived and performed the pre- and post-test results of learning English with and without AI-assisted tools, as a contribution to knowing more about its impacts 'on the ground'. The objective is that the findings may inform students, instructors, and pertinent educational authorities on how AI technologies can be employed in customized and in-class learning.

### **1.1 Literature Review**

The study aims to explore the effects of using AI tools in higher education, specifically for improving academic English reading skills. The literature review will analyze previous studies on the potential applications of AI in higher education for the English education field. While no specific studies highlight the impacts of AI tools in

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assisting academic English reading, our analysis will focus on this area and provide an overview of related AI studies, with AI serving as the focal point of this research.

### 1.1.1 AI-assisted Tools for English Reading Improvement

First and foremost, AI, or machine intelligence, is intelligence demonstrated by machines as opposed to the natural intelligence shown by humans and animals as a tool that can be used for teaching or learning English, making the learning platform smarter [9]. Successful applications of AI technologies in higher education institutions (HEIs) in college operations involve enhancing student learning experiences and offering student support, among other benefits, which can improve student learning performances [10], [11], [12]. So, combining AI-assisted tools to develop comprehensive English abilities can provide a better experience and support in assisting students in their English language learning. Then, suppose we aim to develop students' comprehensive English language abilities. In that case, the focus should also be on improving students's abilities to acquire and process information, analyze problems, and solve problems in English [13], especially in the context of reading. Before we can achieve this goal, it is essential to understand the specific applications of AI in education, particularly in the English reading section. Some notable AI applications include ChatGPT, AI-powered Chatbot, and other AI apps that provide comprehensive assistance [14], summarisation [15], question-answering [14], [15], vocabulary development [15], text simplification [16], reading fluency improvement [17], translation and paraphrasing [14], and personalized recommendation [14]. Here are some AI applications that students used in this research:

Table 1. Examples of AI Applications

No	AI App	Roles
1	ChatGPT	Text Comprehension, Vocabulary Building, etc.
2	Chatpdf	Summarisation, Question-answering, vocabulary development, etc.
3	QuillBot	Paraphrasing, Summarization, Translation, etc.
4	Monica	Explanation, Summarization, Question-answering, etc.
4	Perplexity	Question-answering, Integrating research results, etc.
5	Speechify	Text-to speech

### 1.1.2 Academic English Reading Skills and the AI Integration

Reading is a crucial educational skill necessary for academic success and continuous learning. Although some may perceive reading as a simple skill, it is a complex process that demands various abilities [18]. Therefore, to achieve reading comprehension, students must have cognitive and linguistic skills to understand the text [19]. Social cognition is of paramount importance in reading comprehension, as individual differences in social-cognitive abilities are related to the linguistic processing of narrative viewpoints, influencing how we interpret and engage with narrative viewpoint markers in reading, highlighting the intricate relationship between our understanding of others' minds and our processing of narrative content [20]. Linguistic abilities also made unique and direct contributions to reading comprehension skills and reading achievement, even after accounting for general cognitive abilities. This shows that the effect of linguistic comprehension on reading comprehension becomes more efficient and ceases to be a

bottleneck for adequate reading comprehension [21]. Therefore, students must develop vocabulary acquisition and critical thinking abilities to excel in English reading comprehension.

Additionally, Pido & Mubarokah [22] indicate that teachers can improve reading comprehension by integrating skimming and scanning techniques into reading activities, customizing instruction for individual students, identifying crucial details to enhance understanding, and promoting speed reading. Since skimming and scanning approaches were indeed efficient in improving students' reading comprehension [23]. Skimming text can streamline the reading process, help students grasp the text's structure, and enhance the interpretation of the writer's tone or intonation [24]. In contrast, scanning can assist students in extracting information from reading while maximizing their time [25]. However, this technique grew outmoded or obsolete as time progressed, and the academic community demanded more to advance educational settings since most students grappled with reading. Students fail to comprehend a passage [26] since many of them are uninterested in reading English materials [27], [28]. This, combined with a lack of vocabulary among the students, inhibits their abilities to comprehend the reading text [29], [30]. Consequently, students lose enthusiasm and drive to read [31], mainly English texts. Therefore, the teacher must assist the students in acquiring successful reading skills based on the difficulty. They can also utilize technology tools, such as AI-assisted tools, for interactive skimming and scanning activities to create a dynamic learning environment that fosters essential reading skills in students [22].

AI-assisted tools are some technologies that students may use to facilitate and enrich academic learning and performance. AI technology is in the public spotlight and offers promise for a more fantastic future of education since its integration is revolutionizing our educational system [32], [2]. Therefore, AI in Education (AIED) research has at its core the desire to support student learning. Many current commercial AI systems developed for education, such as Intelligent Tutoring Systems (ITS), focus on providing automated, adaptive, and individualized instruction, offering students a personalized and adaptive learning experience [33]. For example, CoAsker, or an AI-based tool for student question generation (SQG), which is an effective way of enhancing reading comprehension, is utilized by students to generate basic cognitive questions and reveal improved knowledge acquisition [34]. Moreover, AI-driven language learning apps positively impact participants' improvements and outcomes in vocabulary acquisition, offering significant growth in vocabulary over time [35]. In academic reading, students must actively engage in the text, using critical reading strategies to determine and decode its underlying meaning and assess the correlation between the text and their studies [36]. While AI-powered technology can provide not only the explanation of complex or technical words but also the background of those terms, it can also promote cognitive skills to improve critical thinking for English reading. AI in English learning has also been proven to encourage learner motivation, engagement, and creation [34], [35]. For instance, teachers incorporated ChatGPT as a supplementary tool. They provided students with specific guidance for English learning language addresses, which can help them cultivate their independence and autonomy as learners and thinkers and encourage them to judge [37]. Therefore, AI technology can be

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used to enhance English learning for students [38], especially in the realm of reading, and the effectiveness of AI can be used to provide an interactive learning experience that ultimately leads to improved learning outcomes [39]. For example, a study from Alashwal showed that AI could revolutionize education by offering personalized recommendations, analyzing student data, and creating adaptive learning paths based on individual progress [40]. Intelligent tutoring systems provide personalized instruction while emerging technologies such as virtual reality and gamification enhance engagement. Additionally, AI automates assessment processes, optimizing teaching strategies and improving learning outcomes. Besides these advantages, some concerns were also addressed, such as excessive overreliance on AI technology and its ethical implications. While using generative AI (Gen-AI) to enhance student learning showed significant positive perceptions of Gen-AI integration and improved exam scores, long-term vigilance regarding overreliance is vital [41]. More importantly, ethical issues were identified, such as privacy or misuse of private data, by the indiscipline use of AI in education, which might pose certain risks or threats for both students and teachers [42].

## **1.2 Research Aims and Questions**

The present study explores the impact of AI tools in the reading section of English language learning. Previous research has concentrated on the use of AI in the writing section and its overall impact on English language learning (e.g., [7], [15], [37], [40], [43]). However, integrating AI technology into English educational settings, especially for academic reading, still lacks clear evidence. This suggests that the deficiencies identified in the impact of AI on enhancing academic English reading skills need to be examined, thereby exploring the overall improvement of the learning experience for students. To bridge the gap, this research investigates the effectiveness of combining traditional teaching/learning methods with AI-assisted technology to improve academic English reading skills in reading comprehension, vocabulary acquisition, and critical thinking. For this reason, this paper analyses the impacts of AI-assisted tools on enhancing academic English reading skills by emphasizing three main research questions:

- (1) Are AI-assisted tools significantly effective in improving academic English reading skills?
- (2) In what ways do students perceive the experience of using AI technology to improve English reading proficiency?
- (3) What challenges and difficulties do students encounter when using AI-assisted tools?

## **2. METHODS**

The study was conducted via a mixed-methods approach, which employs a sequential explanatory design, including quantitative and qualitative data, to explore and compare the consequences of two groups of students: one utilizing AI tools and one not utilizing AI tools. The goal was to assess whether AI tools could enhance academic English reading skills, such as reading comprehension, vocabulary acquisition, and critical thinking, in both classroom and personalized learning settings. The upcoming sections will offer detailed information about the participants, procedures, materials, study design, and data analysis.

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## 2.1 Research Participants

The research was conducted at Dali University in Dali, Yunnan, China. There were 24 participants, consisting of 12 Chinese and 12 international students. Among them, six were majoring in English, and 18 were majoring in non-English subjects. The participants were randomly selected for an experimental study class, a survey, and semi-structured interviews. Seven participants were male, while seventeen were female. None of the Chinese students had taken the IELTS exam before. In contrast, all Indian and Pakistani international students had taken it once or twice, and other Asian students had never taken it. The 24 participants were divided into two groups: experimental and control groups. To ensure transparency, a “lucky draw” method was used, where participants blindly selected a ball from a box, with each ball labeled “E” or “C” to determine their group assignment.

Table 2. Participant profiles

Experimental Group			Control Group		
Participant	Nationality	Age	Participant	Nationality	Age
PE1	Chinese	19	PC1	Chinese	22
PE2	Chinese	21	PC2	Cambodian	24
PE3	Chinese	19	PC3	Indian	21
PE4	Chinese	21	PC4	Chinese	19
PE5	Chinese	21	PC5	Pakistani	21
PE6	Chinese	19	PC6	Pakistani	21
PE7	Chinese	19	PC7	Chinese	23
PE8	Cambodian	26	PC8	Cambodian	21
PE9	Indian	23	PC9	Vietnamese	20
PE10	Chinese	20	PC10	Vietnamese	21
PE11	Indian	22	PC11	Burmese	19
PE12	Cambodian	23	PC12	Chinese	20

\*Degree: bachelor degree.

## 2.2 Research Procedures

The research procedure involved three sessions, each lasting four weeks: an experimental study, a survey, and semi-structured interviews.

During the experimental study, two groups of students received English reading instruction from a professor with five years of experience in teaching English. The control group was taught using traditional methods, while the experimental group received instruction using traditional methods and AI-assisted tools over a 16-hour class. The control group's method involved teachers providing reading materials in advance, students previewing and checking the dictionary for unfamiliar words, and class discussions on the background and main ideas of the reading, followed by practice exercises. In addition to traditional methods, the experimental group had access to AI tools to provide reading materials in advance, including summaries, technical term explanations, and short questions. Students used AI tools before class to improve their understanding, utilizing features such as Chatbot, English-Chinese translation, and vocabulary checking. Pre- and post-tests were conducted to assess students' English reading proficiency.

Following the 16-hour class, both groups completed a 60-minute survey with different questionnaires due to the differing teaching methods. The final stage involved semi-structured interviews with five voluntary students from each group.

### **2.3 Research Materials**

The study utilized Cambridge IELTS Academic 15 [44] and 16 [45] reading tests for instruction and Cambridge IELTS Academic 18 tests 1 and 2 [46] as pre- and post-tests, respectively. To ensure reliability and transparency, students were not exposed to the pre- and post-tests beforehand and had never seen or completed these tests.

The questionnaires were developed by the authors and consisted of three sections. The first section gathered demographic information and asked for the participant's personal and academic background details. The second section aimed to collect information on the participants' perceptions of the difficulty level and comprehension of the tests, using a six-point scale ranging from "too hard" to "too easy" and allowing for additional thoughts from respondents. The last section focused on eliciting participants' perceptions of the difficulty of the content of the pre- and post-reading tests, with responses recorded on a five-point scale, ranging from "too much task and unknown vocabulary to deal with" to "too hard to understand the reading and to get main ideas of the reading." The questionnaires were written in English.

Semi-structured interviews were conducted, with straightforward interview questions and strategies, to gather rich information about teaching and learning with or without AI-assisted tools while maintaining focus on the study objectives. The questions were designed to be easily understandable and to maintain a sense of sensibility, relevance, and neutrality. The interviews began with questions about the frequency and method of lesson previewing and exercise completion before delving into more complex topics, such as interest in using AI for learning. As a result, the participants provided valuable insights and enthusiasm, improving the depth and quality of the collected information. The interview was recorded by phone and replayed to ensure accurate data collection.

### **2.4 Research Design and Analysis**

The research design emphasized data collection, including pre- and post-test results, surveys, and semi-structured interviews. To address RQ1, the focus was on comparing both groups' pre- and post-test scores to determine if AI-assisted tools, combined with traditional teaching methods, are more effective in improving academic English reading skills than conventional methods alone. In examining RQ2, a survey was conducted to explore the impact of AI technology on specific reading skills, such as comprehension, vocabulary acquisition, and critical thinking, based on students' perceptions. RQ3 was investigated by focusing on student motivation and confidence through interviews, exploring the impact of AI on their learning experience and any concerns they may have encountered while using AI tools.

The study used a mixed-methods approach, gathering both quantitative and qualitative data. Quantitative data was obtained from pre- and post-test measures and surveys, while qualitative data was collected through semi-structured interviews. The pre- and post-test measures will be analyzed using a t-test in SPSS [47], a paired samples t-test and a comparison of the performance of two groups will be analyzed by a t-test, two paired samples t-test to determine if there is a significant difference between them. The survey data from the questionnaires will be analyzed using descriptive statistics to understand students' perceptions of the impacts of AI-assisted tools on academic English reading skills, including

comprehension, vocabulary acquisition, and critical thinking. The semi-structured interviews will be analyzed using content analysis to observe students' engagement and motivation in both classes. The data collected will be analyzed to comprehensively explore the impacts of AI in higher education on academic English reading skills, combining the statistical analysis derived from the pre- and post-tests and the survey data with the rich, nuanced perspectives expressed by the interviewed results and providing a more holistic view of the subject, enriching the overall contribution to the existing literature.

### 3. RESULTS AND DISCUSSION

Following the pre- and post-test measures analysis, the survey, and the interview, we segmented the analysis into two parts: quantitative data and qualitative data. Quantitative data contains an analysis of academic English reading skills with and without AI tools, a comparison of performance with and without AI tools, and an examination of survey results. In contrast, qualitative data includes a review of semi-structured interview outcomes.

#### 3.1. Quantitative data

##### 3.1.1 Analysis of academic English reading skills with and without AI tools

The outcomes of the paired sample t-test scores are shown in Table 3 to explore differences in improvement in English reading before and after taking classes for both experimental and control groups. Initially, the experimental class had a significant difference between the means of the students' pretest and posttest scores. There was a substantial increase in reading scores post-intervention, with a t-value of -4.167 and a significance level of 0.0015. This means that the posttest scores were higher than the pretest scores, with an effect size of around 84.09%, while the control class displayed an insignificant difference between the means of pretest and posttest reading scores. There was a trivial improvement in reading scores after the intervention, with a t-value of 1.060 and a significance of 0.3116. This illustrates that the pretest scores were still higher than the posttest scores, with an effect size of around 85.23%.

This finding corroborates recent studies [10], [11], [12] that also underscore the successful enhancement of student learning experiences and the provision of student support through AI technologies. These benefits can ultimately lead to improved student learning performance. As a result, these suggest that the experimental group had a significant improvement, while the control group had an insignificant improvement in English reading comprehension.

Table 3. Results of paired sample t-test for the students' pretest and posttest reading test.

Class	Test	Mean	Standard Deviation	n	df	(t) Value	Significance	Size effect
Experimental	Pretest	21.33	7.67	12	11	-4.167	0.0015*	84.09%
	Posttest	26.33	6.70					
Control	Pretest	17.50	8.29	12	11	1.060	0.3116*	85.23%
	Posttest	16.16	6.68					

\*Significant at ( $\alpha \leq 0.05$ ).

### 3.1.2 Comparison of performance with and without AI tools

We examined if traditional educational settings with and without AI-assisted technologies affected university students' academic English reading skills by comparing their gains from reading test pretest and posttest scores. Table 4 shows the results of two-sample assuming equal variances t-tests that showed the Experimental group's gain ( $M = 5$ ,  $SD = 4.156$ ,  $n = 12$ ) was expected to be larger than the Control group's gain ( $M = -1.33$ ,  $SD = 4.355$ ,  $n = 12$ ). This difference was statistically significant, with  $t(22) = 3.644$  and  $p = 0.000715$  (one-tail hypothesis). This reveals that the experimental group's educational settings were more effective than the control group's.

Table 4. The gain of two groups from the pretest and posttest reading test

Gain	Mean	Standard Deviation	n	df	(t) Value	Significance
Experimental Group	5	4.156	12	22	3.644	0.000715*
Control Group	-1.33	4.355	12			

\*Significant at ( $\alpha \leq 0.05$ ).

The analysis results show that AI-assisted tools can improve students' reading comprehension. There were apparent differences in pre- and post-test scores between the experimental and control groups, with the experimental group showing significantly more significant improvement. This supports the study of [39] and indicates that AI has the potential to enhance learning experiences by creating more dynamic and adaptive learning environments that support learners' diverse needs.

### 3.1.3 Examination of survey results among experimental and control groups

This part presents the collected data results to answer research survey questions. Each of the findings is detailed through tables, ranging from the experimental group (12 participants) to the control group (12 participants).

According to Table 5, for the experimental group, the responses on the degree of difficulty of the exam before and after taking the class, with 67% ( $n=8$ ) of the total, said that the pretest was hard. 2 students (17%) indicated that it was too hard. In comparison, the other two remaining students (17%) stated it was either not too hard or too easy. However, after completing the class, it can be seen that 83% of the students ( $n=10$ ) agreed that the post-test was neutral, while the other two students (17%) stated that it was easy. In this way, we can prove that there is a significant improvement for students using AI to improve their English reading proficiency. For the control group, the pretest, six students, or 50% of the participants, stated that the test was hard, whereas 42% ( $n=5$ ) agreed it was too hard. Just one student (8%) selected the neutral option. On the other hand, in the posttest, 33% ( $n=4$ ) of the total respondents stated that the test was too hard, whereas most respondents (50%) agreed it was hard. Only two students (17%) selected the neutral option. Therefore, we can conclude that offering solely conventional learning without AI-assisted tools failed to enhance academic English reading proficiency significantly. Integrating AI-based tools and resources with traditional teaching approaches results in much more significant gains in students' English reading proficiency than relying solely on conventional methods without technological assistance.

Table 5. How did you feel about the examination

Test Option	Pretest				Posttest			
	Participants' answers		Percentage		Participants' answers		Percentage	
Group	E	C	E	C	E	C	E	C
Too hard	2	5	17%	42%	0	4	0%	33%
Hard	8	6	67%	50%	0	6	0%	50%
Neutral	2	1	17%	8%	10	2	83%	17%
Easy	0	0	0%	0%	2	0	17%	0%
Too easy	0	0	0%	0%	0	0	0%	0%

Table 6. What problems did you encounter in the examination (Select all that apply)

Test Option	Pretest				Posttest			
	Participants' answers		Percentage		Participants' answers		Percentage	
Group	E	C	E	C	E	C	E	C
There are too many tasks to deal with	10	12	26%	29%	7	10	35%	26%
Too much unknown vocabulary	10	10	26%	24%	5	9	25%	24%
Too hard to understand the reading	11	9	29%	22%	4	8	20%	21%
Too hard to get the main idea of the reading	6	10	16%	24%	4	11	20%	29%
Others	1	0	3%	0%	0	0	0%	0%
Total	38	41	100%	100%	20	38	100%	100%

According to Table 6, the experimental group illustrated a significant decrease in students' problems from the pretest (n=38) to the posttest (n=20). In the pretest, ten students, or 26%, were confronted with both complex tasks and unfamiliar vocabulary, while the majority of respondents (n=11) stated that the % of students facing reading comprehension consisted of 29%. Moreover, 16% (n=6) and 3% (n=1) represent the percentage of identifying main ideas and other issues, respectively. Meanwhile, in the posttest, 7 participants (35%) encountered the problem of managing multiple tasks, while 25%, or five students, had trouble with unknown words while doing the reading. Four students (20%) mentioned struggling with achieving reading comprehension and identifying main ideas. In contrast, for the control group, in the pretest, 12 students, or 29%, reported that they encountered significant tasks to deal with, while 24% (n=10) of the reading issues were considerably unfamiliar with vocabulary and grasping the main idea of the reading. Furthermore, nine students (22%) found the reading material too hard to understand. In the posttest, the percentages of facing the problem while doing the reading were 29%, 26%, 24%, and 21%, respectively, representing the issues of having difficulties understanding the main idea (n=11), managing complex tasks (n=10), struggling with unknown vocabulary (n=9), and encountering reading comprehension problems (n=8). In this way, the number of

students' issues while completing the reading in the pretest (n=41) was slightly more significant than in the posttest (n=38).

Hence, the experimental group significantly improved academic English reading proficiency compared to the control group. This was evident in decreasing students' problems during the pretest and posttest, particularly in reading comprehension, vocabulary acquisition, and critical thinking. The study "Students-AI Questions for Enhancing Reading Comprehension" [34], [48] supports these findings, suggesting that AI has the potential to revolutionize language assessment by providing interactive engagement and generating comprehension questions, thus promoting autonomous learning for students. Another study [35] also emphasizes that AI-driven applications can personalize the learning experience, offer feedback, and enhance retention and recall abilities. It also highlights the role of AI in cultivating critical thinking skills through personalized learning, AI projects, workshops, hands-on activities, and integrating critical thinking [49] into AI literacy courses, preparing students for an AI-driven future [36].

## **3.2. Qualitative data**

### **3.2.1. Review of semi-structured interview outcomes**

This part emphasizes the outcomes of qualitative data in terms of observing students' engagement and motivation toward both classes, focusing on three parts: (a) the engagement of previewing the lessons; (b) the motivation of involving students in class discussion and practicing; and (c) obstacles. There are specific questions for each group in this semi-structured interview due to the different learning methods being asked and discussed by the total number of 10 students from both the experimental and control groups, such as:

QE1: How often and how did you preview the lesson before class?

QE2: How much time do you typically spend previewing the lesson?

QE3: How effective do you think previewing is in improving your understanding of the reading?

QE4: How often do you find it helps you to complete assignments or exams?

QE5: How would you rate your overall experience after this session with AI-assisted tools?

QE6: Did you find the AI tools helpful in improving your academic English reading skills?

QE7: How likely are you to continue using AI tools to improve your English reading in the future?

QE8: Please rate the user-friendliness of AI tools.

QE9: Did you encounter technical issues or difficulties using AI tools?

QE10: Would you recommend using AI tools to teach others academic English reading skills?

All of the experimental group's students (n=5) expressed that they actively and passionately engaged for the entire session by always (n=1) or usually (n=4) previewing the summary created by AI-assisted tools for roughly 20 minutes (n=5). Students also thought that previewing was very effective in boosting their grasp of the topic (n=5) and often assisted them in completing course tasks (n=5) or tests (n=3). Engaging in a completed preview

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successfully motivates students [26] to participate in each class discussion (n=4). In this way, students also revealed that the whole experience with AI-assisted tools supplementing traditional teaching methods was excellent (n=5). They are very likely to continue using AI tools further to develop academic English reading skills in the future (n=5) because AI helped engage and motivate a greater extent in personalized (n=5) and in-class (n=3) learning activities in improving English reading proficiency [48] by minimizing previewing tasks (n=3), conserving more excellent time (n=5), and supplying more learning information (n=4). Moreover, students also discovered that AI tools are still somewhat user-friendly (n=3) regarding some challenges, such as overreliance on AI-generated data [31], which sometimes can practically consist of technical problems [32]—unreliable or untrue information (n=2). Besides this issue, all students (n=5) stated that AI tools still aided them in gaining considerably more confidence in their ability to interpret and evaluate texts in English. More importantly, they (n=5) are also continually inclined to advocate using AI tools for learning academic English reading skills to other individuals. The following are samples of students' responses to this point:

PE1: "I always preview the lesson before class for about 20 minutes, using AI-assisted tools to help me summarise the reading and check unknown vocabulary."

PE5: "Previewing with AI is effective because it helps me understand the topic's main idea, complete the reading quickly, and provide loads of reading-related information. Yes, I have learned a lot of it."

PE7: "In my opinion, I had an excellent experience with the help of AI tools in learning English reading. For example, due to a ready pre-class preparation with the help of AI tools, I was confident to participate in any class discussions, which motivated me to study without any hesitation. And lastly, I will continue using AI tools in my studying, hoping it will be helpful to give me more motivation to engage in self-studying and in-class activities."

PE9: "Yes, while using AI tools to improve my English reading in the session, I faced some technical errors from AI that provided me with some information that wasn't reliable, so sometimes I will check it before trusting AI-generated data. By the way, I am happy to recognize AI tools that helped me greatly in my learning."

PE12: "I will tell my friends about these AI-assisted tools. It is amazing to have such technology to help us study, which can save time and reduce the workload. Simply put, it's very convenient to study English with AI."

QC1: How often and how did you preview the lesson before class?

QC2: How much time do you typically spend previewing the lesson?

QC3: What methods do you use to preview the lesson before class?

QC4: How effective do you think previewing is in improving your understanding of the reading?

QC5: How often do you find it helps you to complete assignments or exams?

QC6: Do you agree that conventional learning methods effectively improve English reading?

QC7: Did you feel engaged and motivated while learning with traditional learning methods?

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All of the control group's students (n=5) revealed that they unpassionately engaged for the entire session by rarely (n=3) or sometimes (n=2) previewing the reading for approximately 5 minutes (n=1) or 10 minutes (n=4) by reading the introduction and conclusion (n=5) and scarcely verifying unfamiliar vocabulary (n=2) due to the time consuming (n=4), resulting in them being unable (n=4) or losing motivation (n=1) to participate in class discussions. Students also claimed that previewing had an insignificant (n=3) or neutral (n=2) effect on their understanding of the topic and was seldom (n=4) helpful in completing course assignments or tests. Hence, it unsuccessfully motivates students to take classes on the skills of reading in English, consuming time (n=5) and rendering learning challenging (n=3). In this way, students also neutrally (n=4) agreed that the conventional learning approach proved helpful in improving academic English reading skills (n=4) and enhancing understanding of complex academic texts (n=3). Moreover, all students (n=5) stated that the traditional learning method alone was unproductive in enticing and motivating them to a more significant level in personalized and in-class learning endeavors to improve their academic English reading abilities. More importantly, no technical problems were discovered during the learning process (n=5). However, skimming the text (n=5), scanning for keywords or headers (n=5), reading the introduction and conclusion (n=3), checking unknown terminology (n=2), other strategies used during previewing and in-class learning activities were not stated to be effective in strengthening their learning but were boring (n=4) and meaningless (n=2) to offer confidence or motivation to continually advocate the use of these learning practices to other individuals. The following are samples of students' responses to this point:

PC2: "Talking about previewing, I'm not into it much; maybe no more than 5 minutes. I rarely did a preview before class; if I did, I just looked at the introduction and sometimes the conclusion. Learning English by skimming and scanning was boring, and I can't see the point."

PC3: "From my perspective, previewing for about 5 minutes was not effective enough to help improve my English reading, and I couldn't even complete any assignments from the reading; it was too hard with loads of unknown vocabulary that I needed to check one by one; it's too much, and I don't like to do that."

PC8: "I disagree that conventional learning methods can improve my English reading in this digitalized world. I need technology to help as it took me too long to study. This learning, for me, was behind the times. I don't recommend it to everyone, ever."

PC1: "By learning this way, I can't see my confidence in going on; even though there were no problems with learning this way, for me, it is a big no, boring!"

PC12: "Traditional learning methods were unproductive; it took too long to understand the reading. There is nothing wrong with skimming and scanning, but they were too traditional, so I can't find any interest in continuing them. I think it needs more strategies or technology to make it more interesting and less time-consuming."

#### **4. CONCLUSION**

The research involved 24 undergraduate students in experimental teaching/learning classes and collected quantitative and qualitative data through pre- and post-test results,

surveys, and semi-structured interviews. The study aimed to explore the impact of AI-assisted tools on academic English reading skills in higher education, focusing on enhancing reading abilities and personalized learning using AI technology. It sought to understand how these tools can improve reading comprehension, vocabulary acquisition, and critical thinking while identifying potential challenges such as overreliance on AI and ethical implications. The study revealed significant findings regarding the impacts of using AI-assisted tools for academic English reading, providing valuable insights for educators and learners. The study has answered the research questions as follows:

Firstly, for RQ1, the results indicate that AI-assisted tools significantly enhance academic English reading skills. The experimental group that used AI-assisted tools in conjunction with traditional methods showed a noticeable improvement in reading comprehension compared to the control group that relied solely on conventional methods. This is supported by the paired sample t-test results and the comparison of the performance between the two groups, which revealed a substantial increase in reading scores post-intervention for the experimental group. In contrast, the control group showed an insignificant improvement.

Secondly, for RQ2, the research indicated that students in the experimental group had a positive perception of using AI technology. This is supported by the surveys and semi-structured interviews, which revealed that the employment of AI technology has been a pleasant experience, with students reporting a considerable enhancement in their learning. AI tools help students acquire reading abilities in English by making their education more convenient, motivating, and effective. Moreover, they found that previewing with AI tools was highly effective in improving their understanding of the topic, completing course tasks, and participating in class discussions. Students also rated the user-friendliness of AI tools positively, and they are expected to continue adopting and promoting AI technology, as it is more exciting than solely conventional learning methods.

Lastly, for RQ3, the study identified and expounded upon the challenges and difficulties students encounter when engaging with AI-assisted tools, shedding light on the overreliance on AI tools and the ethical implications, as they may sometimes provide unreliable information. However, overall, students still found AI tools beneficial in gaining confidence in interpreting and evaluating texts in English and were willing to recommend their use to others.

The results of this research are poised to contribute significantly to academic and scientific communities. Academically, the study's findings offer valuable insights for educators, instructors, and developers of AI-assisted tools for English language learning. Educators can leverage these insights to enhance their understanding of effectively using these tools, while instructors can update their teaching methods accordingly. On the other hand, developers can utilize these insights to improve their applications' effectiveness. The study's findings also provide valuable insights into the potential benefits of using AI tools to enhance university students' English reading skills, highlighting the challenges students may face. This information can inform instructors, educators, and app developers in evolving targeted interventions and support mechanisms. From a scientific perspective, the results of this study have substantial implications for developing targeted interventions in areas such

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as educational sustainability and technology. By understanding the influence of AI-assisted tools on enhancing English reading skills, researchers can tailor their strategies and research areas to optimize resource allocation, enhance decision-making processes, and improve operational and research efficiency across these various sectors. This clarity can lead to improved educational systems, heightened technological and academic effectiveness, and better overall outcomes in practical applications. The dissemination of these research findings through scholarly publications and conferences will further expand the knowledge base in AI-enhanced English language learning. This sharing of insights will foster collaboration among researchers, educators, and developers, leading to continuous advancement in integrating AI tools for educational purposes. Additionally, the practical implications of this study can guide policymakers in making informed decisions related to academic policies and investments in technology-enabled learning solutions. Overall, the potential impact of this research extends beyond academia, influencing the broader educational landscape and contributing to the ongoing development of innovative approaches to English language instruction.

Furthermore, while this study has offered valuable insights into [topic], it is essential to acknowledge its limitations. One notable constraint is the relatively small sample size, just Chinese and international students at Dali University, which may impact the generalizability of the findings. The limited number of participants (24 participants) might not fully capture the diversity within the target population, potentially constraining the external validity of the results. Future research endeavors should prioritize the inclusion of a more extensive and diverse sample to enhance the robustness and applicability of the study's conclusions. External factors, such as socio-background, language proficiency, or individual learning styles, should also be considered when controlling these variables to gain a more accurate assessment. Additionally, expanding the sample size could facilitate a more comprehensive exploration of [specific aspects] and contribute to a more nuanced and precise understanding of the phenomenon under investigation.

The study's implications underscore the collective responsibility of various stakeholders in advancing teaching/learning methods to improve English reading proficiency. The findings emphasize the novel teaching/learning methods to contribute to the educational society of improving academic English reading abilities by empowering them to navigate their academic pursuits and excel at a higher education level.

Last but not least, in further studies, these future research endeavors are encouraged to address these limitations in different directions, offering more nuanced perspectives and refining our understanding of the intricate dynamics between AI applications and students' psychology or health.

## **5. SUGGESTIONS**

According to the current study's findings, some suggestions are put forward to researchers, educators, and students so that they may avoid the negative aspects of including AI applications in education and training processes and benefit from their positive aspects. Recommendations for future research were also stressed as follows:

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## 5.1 Suggestions for Researchers

Researchers should conduct long-term experimental research with more specific apps to determine the effects of AI applications such as ChatGPT in education. Meanwhile, to improve further study, researchers should focus more on the following steps:

**Expand the sample size:** Including a more extensive and diverse sample of students from different institutions and backgrounds would increase the generalizability of the findings and provide a more comprehensive understanding of the impact of AI-assisted tools on academic English reading skills across a wider population.

**Consider additional variables:** Incorporating socio-background, language proficiency, and individual learning styles into the research design would allow for a more nuanced analysis of how these variables interact with AI tools and their effects on reading skills.

**Explore long-term effects:** Conducting longitudinal studies to examine the long-term impact of AI-assisted tools on students' academic English reading skills and overall language development would provide valuable information about the sustainability of the benefits.

**Investigate different types of AI tools:** Studying a more comprehensive range of AI-assisted tools and their specific features and functionalities could help identify which tools are most effective for reading skills and learning contexts.

**Address ethical and privacy concerns:** Further research is needed to explore the ethical implications of using AI-assisted tools in education, such as data privacy, algorithmic bias, and the potential impact on students' learning autonomy.

By taking these steps, future research can build upon this study's findings and provide more in-depth and comprehensive insights into using AI-assisted tools in academic English reading. This will enable the development of more effective teaching strategies and tools, ultimately leading to improved student learning outcomes.

## 5.2 Suggestions for Educators and Students

Educators and students should prioritize the input from field experts. Here are some critical considerations for successfully incorporating AI-assisted tools into the teaching and learning process:

**Professional Development for Educators:** Offering in-service training to educators is essential to help them effectively utilize ChatGPT and other artificial intelligence tools in the classroom.

**Preservice Teacher Preparation:** Including courses on artificial intelligence applications and technology integration in training will equip future educators with the skills needed to incorporate AI tools into their teaching practices.

**Student Empowerment and Responsibility:** While students can benefit from using AI tools like ChatGPT or others as educational aids, it is crucial to emphasize their responsibility as learners and not overly rely on AI applications for academic success.

**Ethical and Legal Awareness:** Educators and students should be educated about artificial intelligence's ethical and legal implications in education. This awareness will help ensure responsible and ethical usage of AI tools.

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Integration into Education Policies: Addressing the ethical and practical implications of artificial intelligence applications, such as ChatGPT, in educational policies will create a framework for researchers, educators, and students to navigate the evolving landscape of AI technology in education.

By incorporating these considerations into integrating AI-assisted tools in educational settings, educators and students can enhance the teaching and learning experience while promoting the ethical and responsible use of AI tools.

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