Investigating the Impact of ChatGPT-Assisted English Language Learning on the Development of Critical Thinking Skills among Iranian EFL Students

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The article can be found in: http://utr.spb.ru/ESP-World/Articles_64/index.html

Received: *August 29, 2026*

Accepted: *September 17, 2026*

Abstract

The rapid emergence of artificial intelligence technologies, particularly generative AI tools such as ChatGPT, has significantly transformed educational practices and language learning environments. While these tools provide immediate access to information and writing support, concerns have been raised regarding their potential influence on students' higher-order thinking abilities. This study investigated the impact of ChatGPT-assisted English language learning on the development of critical thinking skills among Iranian EFL students. Adopting an exploratory case study design, the research was conducted with 40 Iranian EFL learners selected randomly from Farhangian University in Arak, Iran. Data were collected through a standardized critical thinking test and a documentary analysis of ten students' graduation theses. The findings revealed that extensive reliance on ChatGPT in academic tasks may reduce learners' opportunities for independent reflection, creative problem-solving, and analytical reasoning. The analysis also indicated that many students tended to use AI-generated texts as substitutes for their own intellectual engagement rather than as supportive learning tools. Although ChatGPT offers valuable assistance in language learning and academic writing, excessive dependence on this technology may hinder the development of critical thinking competencies. The study highlights the importance of integrating AI tools into EFL education in ways that promote, rather than replace, learners' autonomous thinking and cognitive growth.

Keywords: ChatGPT, artificial intelligence, critical thinking, generative AI, higher-order thinking skills

1. INTRODUCTION

In Iranian higher education, EFL learners are required to submit a thesis as part of the master's degree requirements. This requirement offers learners an opportunity to approve, elucidate, pursue, or even find new insights. It requires the conductor's attention, reasoning, and decision-making, which can help inquire into research problems and develop knowledge. Thus, it is systematic, critical, ethical, and purposeful. The accomplishment of this task is not only challenging for EFL learners but also an interesting feature, as it gives them a measure of control and creativity over what they write. Thus, critical thinking skills are central to producing a reliable master's thesis, especially today, as artificial intelligence (AI) text generators emerge. Chaffee (1988) contends that critical thinking skills are significant for making informed decisions about the credibility of information, whether it is accurate, functional, or creative.

The emergence of AI and Natural Language Processing (NLP) has led to the development of sophisticated, adaptable language models. In fact, generative AI involves a sum of artificial intelligence models that can generate new data centered on structures learned from existing data. These models can generate content across numerous areas, including text, images, and music (Ali & Djalilian, 2023). Generative AI models, including ChatGPT, are built on deep learning techniques and neural networks that analyze, recognize, and generate content resembling human-generated work (Ray, 2023).

Seeking information online is a major concern in higher education, as students rely on ChatGPT for research projects or assignments (Imoh, 2023; Nerantzi et al., 2023; Ray, 2023). University students use ChatGPT to write their theses by typing chatbot-specific prompts and questions, then copying and pasting the answers provided into their research papers without proper citation or critical reflection. According to Marbun (2023), this would assist them in completing their theses without spending the necessary effort required to write original research papers. Nevertheless, this act is hypothesized as being unethical and could seriously affect their critical thinking skills, including engagement, reasoning, problem-solving, and decision-making. Akastangga et al. propose, "The use of ChatGPT should be balanced with the development of independent critical thinking skills and critical evaluation of the information provided by the AI model" (2023, p. 157).

It is important for students to understand the value of academic integrity and to avoid using ChatGPT or other technologies without analyzing, reflecting on, and making decisions about what is useful and relevant to them (Sabzalieva & Valentini, 2023). Thus, the main goal of the present research work is to assess the effects of using AI text generators on EFL learners' critical thinking for writing master's theses. The study aims to examine how writing theses using IA text generators, such as ChatGPT, may harm EFL learners' critical thinking skills.

Notably, the present research is twofold: it explores the potential influence of ChatGPT on critical thinking skills in master's students' theses. Moreover, it is expected to reveal that excessive reliance on AI-assisted technologies for writing master's theses would negatively affect EFL learners' critical thinking skills and written production. Essentially, the English section's pedagogical team at

Farhangian University Center raises learners' awareness of the significance of academic integrity, encourages them to reflect on the ChatGPTgenerated information, and urges them to use ChatGPT or any other technology as an assistive tool with caution. The interplay between AI text generators, critical thinking, and thesis writing motivates this investigation.

The effects of ChatGPT on EFL learners' critical thinking skills have not been extensively examined in the context of thesis writing. Moreover, raising awareness of the critical use of ChatGPT and other chatbot technologies still requires more recommendations (Darwin et al., 2024). Accordingly, Cardona et al. (2023) stress that it is imperative to address AI in education to identify potential opportunities, prevent and mitigate emerging threats, and anticipate unintended consequences. To prove the potential effects of AI text generators on critical thinking, the investigator has selected a specific methodology to answer the research questions. The selected methodology used an exploratory case study to systematically demonstrate that critical thinking is adversely affected by overreliance on chatbots such as ChatGPT. The latter inclines to limit skills such as inferring, generalizing, reasoning, evaluating, and problem-solving. The study also argues for the practical effect of raising EFL learners' awareness of the significance of being critical thinkers when using chatbots.

1. 1. Literature review

1.1.1. Artificial Intelligence in Education

According to the IEEE-USA Board of Directors (2017), AI is a field of computer science that encompasses advances in intelligent machines capable of performing tasks that require human intelligence, such as visual perception, speech recognition, learning, decision-making, and natural language processing. AI applications considerably affect every aspect of human life, including education. AI in education is an academic field of research that investigates how AI tools can support teaching and learning. AI offers opportunities and benefits for education by making learning more personalized, affording authentic learning experiences, helping students become self-regulated, fostering creativity, and reducing teachers' workload (Tuomi, 2018; Mureșan, 2023; Marbun, 2023; Felix & Webb, 2024). In this vein, Walter (2024) ponders the application of AI in education as a conspicuous departure from traditional teaching methods, providing personalized learning experiences and support for diverse educational needs.

The scrutiny of educational research on artificial intelligence revealed a crucial need to examine its impact on education and how teachers and learners can use this knowledge to improve their practices. Holmes et al. (2022) argue that the pedagogical advantage of AI applications is not well defined and that there is little evidence of AI's meaningful impact on the quality of teaching and learning. According to Park et al. (2021), "AI improves upon the acquisition of knowledge that is based on existing data. However, the AI's dependency on the existing data makes it impossible to generate a new knowledge set or a theory that did not exist before" (p. 99). Darwin et al. (2024) and Imoh (2023) note that AI poses challenges, including ethical considerations related to data privacy and security risks.

1.1.2. ChatGPT for Writing a Graduation Thesis

The emergence of ChatGPT as a prominent AI language model has revolutionized higher education in general and scientific research in particular. Indeed, GPT stands for "Generative Pre-trained Transformer" and refers to a set of natural language models advanced by open Artificial Intelligence (AI) (Sabzalieva & Valentini, 2023). Ray (2023) defines ChatGPT as an AI model developed by OpenAI that emerged on November 30, 2022, as an influential tool enabling machines to recognize and generate coherent, systematic, and enlightening responses like human language.

Since late 2022, university students have become aware of generative AI and have begun exploring how ChatGPT could be used to write essays, create project presentations, and assist with research projects. Student researchers can use ChatGPT at various stages of thesis writing. Sabzalieva and Valentini (2023) defined four possible applications of ChatGPT for the process of research, including (a) research design through generating ideas for research questions, (b) data collection based on its datasets, (c) data analysis by suggesting themes or topics for analysis, (d) writing up the research paper as a means to ensure writing quality.

Similarly, Ray (2023) approved various applications of ChatGPT for scientific research. The first application is data extraction from available literature, assisting researchers in rapidly collecting and synthesizing data from various sources, reducing the effort required for traditional literature reviews. The second application is summarizing and synthesizing intricate databases. ChatGPT enables researchers to accurately recapitulate complex data. The third application lies in ChatGPT's ability to automatically identify patterns and trends in data. ChatGPT identifies associations, differences, and existing relations within the information, offering researchers insights that may not arise from traditional data analysis. The fourth application of ChatGPT in scientific research is predictive modeling. ChatGPT can engender predictions about future possibilities. This ability helps illuminate hidden visions, generate new hypotheses, and advance scientific research.

Accordingly, ChatGPT revolutionized research across various fields, raising concerns about efficiency, accuracy, and innovation in academic research. Thus, higher education teachers should be aware of the risks and benefits of ChatGPT. Yet this study will focus on the necessity of learners' critical thinking to ensure the quality of academic output generated by ChatGPT.

1.1.3. The Impact of ChatGPT on Critical Thinking

Critical thinking is defined differently, but common definitions emphasize an individual's aptitude for objectivity, rationality, and analysis of problems and experiences. Abrami et al. (2015) postulate that critical thinking is not manifested in a single ability but rather a range of skills, including analyzing and evaluating, synthesizing, and problem-solving. Critical thinkers often question something before taking it at face value. According to Cottrell (2005), thinking critically and objectively involves mental operations such as attention, categorization, selection, and judgment. These mental processes lead to informed decisions about whether a piece of information is reliable, correct, operational, or creative. Correspondingly, Chaffee (1988) views critical thinking as "our active, purposeful, and organized

effort to make sense of our world by carefully examining our thinking, and the thinking of others, in order to clarify and improve our understanding" (p. 29). These definitions yield an extensive understanding that encompasses analysis, judgment, evaluation, and reasoning.

Even with the multifaceted nature of critical thinking, these skills are vital for students to succeed academically in higher education and in their professional and social lives (Lin, 2018). In higher education, writing a graduation thesis presents challenges that require learners' critical thinking to realize an effective research output. Although the task of writing research papers has now been supported by the emergence of AI tools like ChatGPT, critical thinking skills remain significant for analyzing concepts, justifying positions, questioning validity, challenging and revising previously held norms, and identifying uncertainty. Thus, Students should be aware of the limitations and dangers of ChatGPT. Walter (2024) considers the integration of ChatGPT into educational systems as a potential enhancement to modern teaching and learning methodologies; however, warned of the students' uncritical use of machines, giving chatbots the cognitive tasks they need to operate. Similarly, Felix and Webb (2024) have identified several downsides of overreliance on AI. They argue that this negatively affects writing proficiency, literacy, and critical thinking, thereby reducing individual creativity. In addition, individual writing styles may become flattened by the syntax and grammar of text generated by AI techniques. Sabzalieva and Valentini (2023) describe cognitive bias as a major challenge of the ChatGPT application. As ChatGPT lacks ethical principles, it is unable to differentiate between right and wrong. This AI model learns any cognitive bias present in the data, as it only gathers information from databases and online texts it processes. For that reason, it is crucial to critically analyze the results it affords and compare them with information from other sources.

Overall, using ChatGPT for academic research offers researchers opportunities to enrich the research process and generate more innovative and applicable outcomes. However, ChatGPT should not supplant human intelligence and critical thinking but rather complement them. In fact, producing imprecise research conclusions is a major concern when a student relies excessively on ChatGPT to generate concepts without sufficiently corroborating them through critical analysis.

1.2. Purpose of the Study

As an exploratory case study, the current investigation has significant benefits for exploring the use of ChatGPT as a tool for thesis writing, which may diminish critical thinking skills in EFL learners. Additionally, the study hypothesizes that raising learners' awareness of ChatGPT's use would lead to better critical thinking and discourage overreliance on AI text generators. It strives, then, to reveal that AI and chatbots are neither inherently positive nor negative but require additional attention and critical reflection regarding their potential exploitation, such as in writing graduate theses. In this vein, Gocen and Aydemir (2020) argue that educational institutions and teachers benefit from AI as a supporting tool but also face the drawbacks this technology brings to education.

To this end, the present research examines and analyzes learners' critical thinking levels when using ChatGPT, the extent to which human-like-generated texts reduce learners' critical thinking, and the factors that may lead learners to take machine-generated texts for granted. In addition, it sheds light on

the necessity for learners to become critical of the offered information and to reflect on the sources of the information they consume. In this respect, the study revolves around the following research questions:

- *What might be the effect of ChatGPT use on EFL learners' critical thinking skills?*
- *To what extent do EFL learners demonstrate evidence of thinking critically while using ChatGPT for writing their graduate theses?*
- *Are EFL learners reflective about the integrity of the machine-generated texts?*

2. METHOD AND MATERIALS

The present inquiry is an exploratory case study aimed at examining the potential effects of AI text generators (e.g., ChatGPT) on critical thinking skills in master's students' graduation theses. The investigator has opted for a multi-method approach to data gathering to ascertain the possible extent of the problem under investigation.

2.1. Participants

The target sample comprises 40 master's students from the English Language Department at Farhangian University Center, Arak. These students studied English for four years. Their ages range from 21 to 26. To obtain a representative sample, the researcher randomly selected participants from two available groups, ensuring probability sampling. A simple random sampling technique means that every participant from the population has an equal possibility of participating in the study.

2.2. Instrumentation

The researcher used two instruments to gather data. The first was a quantitative questionnaire designed for students who have completed their graduation theses and have discussed them publicly before the scientific committee. The questionnaire focused on students' experiences with ChatGPT for these writing tasks and the critical thinking skills they use to assess the reliability of the information provided. The questionnaire was prepared based on Peter Honey's (2005) Critical Thinking Test to assess the related skills of attention, analysis, categorization, selection, and judgment. The questionnaire contains 20 Likert-type items, each with five choices, including Never (1), Rarely (2), Sometimes (3), Often (4), and Always (5). Henceforth, each student's score could range from 3 to 15. Additionally, documentary analysis was used as a qualitative research method to explore the effects of ChatGPT on critical thinking and to offer insights into how OpenAI and ChatGPT can enhance or reduce EFL students' critical thinking skills. The documentary research approach examines graduation theses to gain insight into how the research participants operate. Generally, it is intended to assess ChatGPT's overall contribution to students' critical thinking through content and thematic analysis.

2.3. Procedures

Data collection in the present inquiry proceeded through three main stages. Before the data collection process, the researcher conducted focus group interviews to inquire about the use of ChatGPT for thesis writing and to identify its different applications. Throughout the group interviews, the researcher recognized that almost all Master Two students were using ChatGPT and other OpenAI tools to generate research ideas, gather data, and produce summaries and precise literature reviews. The researcher noticed that the students were motivated to use ChatGPT for academic research. Thus, as a second stage, the researcher administered the designed questionnaire to assess the extent to which students think critically when examining ChatGPT's output and making judgments about its reliability. It also aimed at measuring the potential effect of ChatGPT on learners' critical thinking. In the third stage, the researcher randomly selected 10 graduation theses for documentary analysis. The authors of the selected documents confirmed that they used ChatGPT to write their theses and granted the researcher permission to analyze them for research purposes. This process involves an intensive re-reading and review of the theses. The researcher examines theses and applies a critical-thinking evaluation rubric, based on the texts' characteristics, to identify potential incidents pertinent to the possible effects of ChatGPT on critical thinking.

3. RESULTS

3.1. Questionnaire

To investigate the extent to which EFL learners demonstrate critical thinking and their critical reflection on the reliability of ChatGPT-generated output for their graduation theses, the researcher administered a 20item questionnaire exploring what they might or might not do. Table 1 displays the criteria and descriptive statistics regarding learners' use of critical thinking skills with ChatGPT-generated texts.

Table 1

Criteria and descriptive statistics

Item	*Mean*	*Mode*	*Median*	*Standard Deviation*
1. I make notes on the important ideas of ChatGPTgenerated texts.	*7,95*	*9*	*9*	*2,96*
2. I test the assumptions underlying the ChatGPTgenerated texts.	*7,57*	*9*	*9*	*2,68*
3. I avoid being influenced by biased or prejudiced views by questioning ChatGPT-generated facts.	*6,75*	*6*	*6*	*2,29*

4. I summarize ChatGPT-generated texts to ensure I have understood them properly.	*7,35*	*9*	*7,5*	*2,41*
5. I research a subject through different prompts to enhance my understanding.	*7,87*	*6*	*7,5*	*2,57*
6. I state my reasons for accepting or rejecting ChatGPTgenerated texts.	*6,97*	*9*	*6*	*2,95*
7. I assess the credibility of the information produced by ChatGPT.	*5,92*	*6*	*6*	*2,55*
8. I put ChatGPT-generated texts into my own words to help me understand them.	*5,47*	*6*	*6*	*2,10*
9. I double-check ChatGPT-generated output for accuracy.	*6,07*	*6*	*6*	*2,37*
10. I search for parallels and similarities between different prompts on the ChatGPT chatbot.	*6,97*	*9*	*6*	*2,54*
11. I use a set of criteria to evaluate the quality of the ChatGPT-generated texts.	*7,2*	*9*	*9*	*2,66*
12. I break down ChatGPT-generated texts to observe how concepts are ordered and presented.	*6,67*	*9*	*6*	*2,46*
13. I explore ChatGPT-generated texts for ambiguity to ensure their meaning.	*7,12*	*9*	*6*	*2,38*
14. I challenge ChatGPT-generated output that seems to lack scientific rigor.	*6,37*	*6*	*6*	*2,61*
15. I think about the reliability of ChatGPT-generated texts.	*7,05*	*9*	*9*	*2,81*
16. I draw conclusions from data generated by ChatGPT to decide whether to accept or reject an idea or an assumption.	*7,12*	*9*	*7,5*	*2,82*
17. I solicit input from other sources rather than AI text generators to broaden my understanding of a subject.	7,87	6	9	2,57
18. I examine ChatGPT-generated output to determine whether it is logical and makes sense.	7,57	9	9	2,76
19. I search for what is missing in ChatGPT-generated texts rather than counting only on what is given.	7,12	9	7,5	2,65
20. I draw my conclusions rather than sticking to ChatGPT conclusions.	6,97	9	7,5	2,63

The table displays key statistics for each questionnaire item. The use of ChatGPT for thesis writing significantly reduced participants' critical thinking skills, as they were unable to reach the average (7,5) on most questionnaire items. Their mean scores ranged from (5,47) to (7,95). Notably, they show a decreased ability to put generated texts into their own words rating (5,47) as a mean score, question machinegenerated facts with a mean score of (6,75), assess the credibility of AI-generated facts recording (5,92) as a mean score, and challenge generated ideas with (6,37) as a mean score.

Overall, the table's statistics reveal that learners' critical thinking scores are below average. The participants obtained (6,99) as a mean score of the overall 20 questionnaire items, which indicates low-level critical thinking. Moreover, the standard deviation (SD=0.64) was small compared with the overall questionnaire mean, indicating the homogeneity of the sample studied.

The presented scores collectively highlight the multifaceted impact of ChatGPT across the different skills of critical thinking. The results underscore a substantial reduction in participants' ability to test assumptions, summarize ChatGPT output, assess credibility, evaluate the quality of generated texts, set criteria for accepting or rejecting concepts, and draw their own conclusions.

Moreover, the extent of these diminutions varies across critical thinking skills, with a more pronounced impact observed in the ability to paraphrase ChatGPT-generated texts in one's own words, assess scientific rigor, and examine other sources rather than relying solely on AI text generators. Therefore, the present findings confirm that learners' critical thinking is low when using ChatGPT for these writings. This insight indicates the extent to which overreliance on ChatGPT diminishes learners' critical thinking skills.

3.2. Documentary Analysis

Documentary analysis was used to explore the application of ChatGPT to write graduation theses and its impact on learners' critical thinking. The analysis of graduation passed through three main stages: scanning, a superficial view; reading, a more in-depth examination; and interpretation. This cyclical process combines the elements of both content analysis and thematic analysis. The researcher organized the theses into classes and identified relevant passages throughout the content analysis process. A thematic analysis was then piloted, in which the researcher examined the selected data more closely and applied a critical thinking assessment rubric.

Table 2

Critical thinking assessment rubric

Criterion	*Description*
Accuracy	*Data correctness and proper sourcing of information, devoid of ChatGPT ethical issues.*
Clarity	*Clear and concise writing, free of ChatGPT monotony.*
Structure	*Logical organization and coherent flow of ideas free of Chat GPT repetitive phrases or patterns*
Correctness	*Correct language free of ChatGPT grammar and punctuation mistakes.*
Consistency	*connection and consistency between statements in terms of meaning and grammar*
Reasoning	*Supporting claims through giving logical reasons and being aware of ChatGPT fallacies*

Rubric results are analyzed qualitatively to understand patterns and underlying issues in performance. This entails analyzing the characteristics of the work in each category to identify the issues described provided for each criterion.

- Accuracy: data correctness and proper sourcing of information are critical issues when evaluating the quality of an academic output. Most graduation theses encountered issues with information sourcing. The literature reviews in the theses were mostly free of in-text citations, with lengthy paragraphs lacking supporting quotations. In some cases, concepts are supported by incorrect names or dates, and authors have not given proper credit to the original authors or studies. This issue means that students have not tested the credibility of ChatGPT-generated data using multiple reliable sources.
- Clarity: clear and concise writing, free from ChatGPT monotony; produces writing that is attractive, accurate, and vigorous, avoiding monotonous sentence structures and simplistic wording. Monotony often stems from repetitive paragraph forms. Chatbots often offer students the same form of answers. Copypasting AI-generated output without paraphrasing and summarizing results in monotonous paragraphs. This issue is marked in all the analyzed documents, which featured automated paragraphs that appeared to be answers to prompts. The paragraphs contained repetitive sentence patterns, such as long statements, overused phrases (“This is important because...”/ “that is to say”), and broad data points. This indicates that students have not taken notes or put ChatGPT-generated text into their own words. Dependence solely on machine output demonstrates the absence of the critical thinking skill of analysis. Students were drawn to the vast amount of ChatGPT-generated data, which reduced their ability to assess and challenge the content.
- Structure: logical organization and coherent flow of ideas entail arranging content in a structured, intuitive way that helps present claims or arguments. The analysis of these revealed disconnected ideas, making texts difficult to follow. Students often failed to connect each idea to the

previous one. Abrupt shifts or unrelated tangents were noted in almost all theses, suggesting that students copied answers to their prompts without reviewing them multiple times.

- Correctness: correct language free of ChatGPT grammar and punctuation mistakes. ChatGPT can generate texts containing grammatical and punctuation mistakes, such as incomplete sentences, long statements joined inappropriately, incorrect word order, repetitive phrasing, confusion between possessive and plural forms, and unnecessary commas. These grammar and punctuation issues were common features among all the analyzed theses. Undeniably, students have not broken down ChatGPT-generated texts to explore existing ambiguities and ensure that statements are meaningful. Hence, correctness is an important criterion displaying the over-reliance on ChatGPT-generated output.
- Consistency: ensuring connection and consistency between statements in terms of meaning and grammar is critical for coherent and cohesive texts. A lack of consistency can lead to confusion, redundancy, or a disorganized flow of ideas. Inserting prompts to ChatGPT through different tenses resulted in grammatical inconsistencies. The tone and structure of the statements and paragraphs were inconsistent in the analyzed theses. Moreover, the content of the theses lacked consistency in meaning, revealing contradicting claims. In this sense, students have not questioned ChatGPT-generated texts by searching for parallels and similarities between different prompts.
- Reasoning: supporting claims with logical reasons and being critical of ChatGPT's fallacies is crucial for constructing credible texts. Presenting only two options when more possibilities exist, restating the claim as evidence, and depending on a single standpoint without justification or supporting data are the most common fallacies in the analyzed theses. Students have not applied logical frameworks to decide whether to accept or reject an idea or an assumption, nor have they presented diverse types of evidence.

The documentary analysis revealed that students over-relied on ChatGPT to write their graduation theses. Because students are unaware of ChatGPT's limitations, they have not engaged in cognitive processes for questioning data, evaluating content, and making relevant decisions. Thus, they were not reflective about the accuracy of machine-generated texts. These worrying results indicated that ChatGPT might not be the best vehicle for EFL students to write their graduation theses as it reduced their ability to think critically.

4. DISCUSSION

Notwithstanding the existence of empirical evidence supporting the necessity of critical thinking while using AI text generators, EFL students are not mindful of the downsides of AI text generators on the quality of their theses. The results of the current study have significant benefits, directing attention to the efficiency of critically evaluating ChatGPT-generated output. The research data included scores from the critical thinking test and the documentary analysis. The critical thinking test results showed low-level critical thinking, as participants did not reach the average (=7,5), with a mean score of 6.99 across the 20 questionnaire items. These results may answer the first research question, "What might be the effect of ChatGPT use on EFL learners' critical thinking skills?" Indeed, learners put faith in

ChatGPT because they did not apply critical qualities, such as questioning, which rated (7,12) as the mean score, summarizing rating a mean of (7,35), evaluating rating a mean of (7,2), and reasoning rating a mean of (6,97). Thus, ChatGPT has a negative effect on learners' critical thinking. In this manner, the study by Akastangga et al. (2023) on the impact of ChatGPT on students' critical thinking levels yielded positive results, indicating that its application has a modest effect on critical thinking skills. However, they discern that reliance on ChatGPT can diminish critical thinking skills.

The participants have shown low levels of critical thinking when using ChatGPT for thesis writing. Generating human-like written output influenced learners' cognitive operations and diminished their abilities to challenge ideas, test accuracy, analyze content reliability, and present logical reasons with supporting claims. This result may answer the second research question, "To what extent do EFL learners demonstrate evidence of thinking critically while using ChatGPT?" In this vein, Ray (2023) found that overreliance on ChatGPT leads to decreased critical thinking and autonomous problem-solving among researchers. Similarly, a study by Darwin et al. (2024) on the utility of AI in enhancing critical thinking found that AI chatbots are particularly useful for literature reviews, theory analysis, research design, and data analysis. However, they raised concerns about AI's potential drawbacks, including over-reliance and its effects on dynamic critical thinking skills among EFL students.

As for the last research question, "Are EFL learners reflective about the integrity of machine-generated texts?", the documentary analysis indicated a negative effect of over-reliance on ChatGPT, resulting in many issues in learners' writings. The analyzed theses displayed several problems, indicating a lack of learner reflection. Learners did not question 'ChatGPT's language or data correctness, leading them to produce monotonous texts without proper credit. The literature reviews contained texts presenting separate notions in response to prompts, without a logical flow of ideas. This explanation aligns with Marbun's (2023) findings. His study rationalized the necessity of critical thinking to assess the significance and relevance of ChatGPT-generated output. Moreover, using AI text generators such as ChatGPT in scholarly research requires a thorough understanding of their limitations and potential biases. Similarly, Walter (2024) postulated that directly copying and pasting AI-generated texts is not appropriate for addressing biases, ensuring privacy, or certifying ethical use. Instead, students should use AI text generators as informed conversational partners.

5. CONCLUSION

This study aimed to examine the extent to which AI text generators can influence EFL learners' critical thinking. It attempted to direct attention to the use of ChatGPT critically when writing a graduation speech. The researcher took the English language department at Farhangian University Center as a case to investigate the research problem. The findings of this study revealed that learners relied heavily on ChatGPT to generate content without adequately verifying it through critical analysis. Consequently, ChatGPT, as a large language model, affected learners' critical thinking. It influences students' ability to assess the accuracy of the generated data, leading them to rely more on machine output. In addition, ChatGPT reduced students' ability to assess the reliability of the information presented, marginalizing the importance of consulting alternative sources. The obtained results

strengthened the researcher's belief that applying ChatGPT to academic research should be accompanied by unbiased, research-informed analysis, reasonable criteria, and ethical considerations.

The current study recommends that critical thinking skills are imperative to apply ChatGPT in academic research. However, the present study did not examine the significance of focusing on AI literacy to infuse critical thinking into academic research. Thus, this field requires further investigation. Moreover, it is vital to scrutinize whether AI literacy can foster critical thinking when using large language models for academic research.

Conflict of Interest: The author declares no conflict of interest.

Ethical Approval: All participants voluntarily participated in the study. All participants were kept anonymous throughout the study.

Funding: This research received no external funding.

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