AI Critical Thinking Leveraging in Academic Research: Insights from EFL MA Students at the Faculty of Arts and Languages, University of Tripoli, Libya

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ABSTRACT

This study explores how AI tools boost postgraduates' cognitive competency in critical thinking in academic research. The study adopts a qualitative survey, based on Haase's (2010) cognitive processes of critical thinking. It involves 16 Libyan EFL MA female students at the Faculty of Arts and Languages, University of Tripoli, Libya. Students' responses are analyzed thematically, employing the analysis framework of Clarke and Braun (2017). Findings signify that AI tools help students utilize critical thinking processes, enabling them to apply, analyze, synthesize, and evaluate AI-driven content in executing their academic research. The findings also demonstrate that students are conscious that overdependency on AI tools can cause offloading, adverse ethical consequences, and academic dishonesty. Accordingly, this study calls for students to balance the use of AI tools with traditional academic writing conventions. Finally, the study advises supervisors to constantly remind their students to apply AI tools responsibly, and to promote their academic AI-information literacy regularly, so as to produce high-caliber academic research.

Keywords: Academic Research, Artificial Intelligence (AI), Critical Thinking (CT), Libya, Postgraduates

الملخص

تتناول هذه الدراسة أثر أدوات الذكاء الاصطناعي في تعزيز الكفاءة المعرفية في التفكير النقدي لدى طلاب الدراسات العليا في مجال البحث الأكاديمي. وتعتمد الدراسة منهجًا نوعيًا باستخدام استبيان يتضمن أسئلة حول العمليات المعرفية للتفكير النقدي لهاس (2010). وشملت الدراسة 16 طالبًة ليبية ملتحقة ببرنامج الماجستير في مجال تدريس اللغة الإنجليزية كلغة أجنبية بكلية الآداب واللغات بجامعة طرابلس، ليبيا. تم تحليل إجابات الطالبات تحليلاً موضوعيًا، باستخدام إطار التحليل الخاص بكلارك وبراون (2017). تُظهر النتائج أن أدوات الذكاء الاصطناعي تُساعد الطالبات

على استخدام عمليات التفكير النقدي في بحوثهن الأكاديمية، مما يُمكّنهن من تطبيق وتحليل وتركيب وتقييم المحتوى المدعوم بالذكاء الاصطناعي في تنفيذ البحوث الأكاديمية. تُظهر النتائج أيضًا أن الطالبات يدركن سلبيات الاعتماد المفرط على أدوات الكتابة المدعومة بالذكاء الاصطناعي، والتي قد تؤدي إلى التهرب من المسؤولية، وعواقب أخلاقية وخيمة، وانتهاك للأمانة الأكاديمية. ووفقا لهذه النتائج، تدعو هذه الدراسة الطلاب إلى الموازنة بين استخدام أدوات الذكاء الاصطناعي وأساليب الكتابة الأكاديمية التقليدية. وتنصح الدراسة المشرفين بتذكير طلابهم باستمرار بضرورة استخدام أدوات الذكاء الاصطناعي بمسؤولية، وتعزيز معرفتهم الأكاديمية بالذكاء الاصطناعي بشكل منتظم، وذلك لإنتاج بحوث أكاديمية عالية الجودة.

الكلمات المفتاحية: البحث الأكاديمي، الذكاء الاصطناعي، التفكير النقدي، ليبيا، طلاب الدراسات العليا

Introduction

Academic research is a core component of postgraduate programs (Durette et al., 2016). It necessitates surdents to submit scholarly academic research papers to successfully complete their course requirements, mirroring their impetus in learning (Zhao et al., 2021), and pursuing their Master's degrees. Practically, academic research performance is linked to students' competence to produce well-organized, and logically developed work, that conforms to accepted academic writing guidelines. Nevertheless, this endeavor proves to be difficult, mentally taxing, and time-consuming for many EFL postgraduates. Often, students encounter various challenges, which comprise uncertainty in expressing ideas, limited understanding of the subject matter of their academic research topics, and complications in navigating genre-specific features, such as appropriate voice use, and evaluative language (Tahira & Haider, 2019). In addition, postgraduates are anticipated to demonstrate critical thinking competency, from foundational to advanced stages of their academic research (Nag & Dwivedi, 2023). Empirically, this competency is viewed as a disciplined intellectual approach, which incorporates specific elements, guiding how students process, interpret, and manage information effectively within their cognitive abilities (Haase, 2010). Although this capacity is complex and multi-faceted, involving synthesis, analysis, problem-solving, and decision-making processes (Khairuddin et al.,

2021), it supports their development of independent, and analytical thinking during their research writing process (Tahira & Haider, 2019).

In today's academia, the introduction of AI tools has substantially revamped the academic research sphere (Manoharan,2026), expediting literature reviews, automating data analysis and interpretation, and optimizing writing quality (Gerlich, 2025 ; Zeki et al., 2025). Students frequently treat these tools as assistant instruments, profoundly uplifting their self-learning (Elhawaz & Bagigni, 2026), and reinforcing the connection between critical thinking, and academic writing (Ventura & Lopez, 2024). This can be ascribed to the fact that AI tools encompass simulating human thought processes (Fitria, 2021), and develop students' higher-level cognitive skills over memorization, and basic understanding (Gladwin, 2024). Besides, students utilize these tools to improve the clarity, and quality of their writing (Algwil, 2025), and focus more on critical and complex elements of their research (Golan et al., 2023). To this end, students extensively capitalize on a variety of applications, such as Grammarly, Quill Bot, ChatGPT, and others to address grammatical accuracy, refine sentence construction, and enhance the overall readability of their academic work (Latef, 2026 ; Algwil,2025 ; Parker et al., 2023 ; Terentieva et al., 2023). Likewise, students leverage AI tools for brainstorming, drafting original content, rewording texts, and strengthening their arguments (Mohammadi et al., 2026 ; Lawasi et al., 2024 ; Khalifa & Albadawy, 2024).

To update, the upsurge of AI applications in education has turned out to be indubitable, among Libyan students (Elhawaz & Bagigni, 2026). These AI tools have modified EFL MA students' academic research practices in high educational institutions in Libya. These students hold an optimistic attitude towards AI tools in writing, since they boost their motivation, lessen their language anxiety, and self-learn (Elhawaz & Bagigni, 2026 ; Algwil, 2025). They perceive AI tools as being useful for upgrading students' grammatical competence, and vocabulary (Latef, 2026). Apparently, they make use of these tools to maximize the quality of their academic research while they still adhere to academic writing standards, academic integrity rules, and ethical principles as

well as strive to activate critical thinking abilities in their academic work. Thus, guided by Haase's (2010) cognitive processes of critical thinking, including application, analysis, synthesis, and evaluation of information, this study is conducted to answer the following question :

How does the use of AI-powered tools affect Libyan EFL MA students' cognitive processes of critical thinking in academic research throughout the application, analysis, synthesis, and evaluation of AI-driven content ?

Literature Review

Findings of previous studies assert that, postgraduate students increasingly rely on AI tools throughout the different stages of their academic work (Alashab, 2026), from conducting literature reviews and analyzing data to designing experiments and drafting documents (Madanchian & Taherdoost, 2025). This assimilation consolidates argumentation, and critical thinking, essential for promoting academic achievements, and developing deep-rooted personal growth (Raza et al., 2024). On top of that, these tools help students manage their time more successfully, and enhance the efficiency of their research activities (Huong & Dao, 2026 ; Zeki et al., 2025). However, the usage of AI-powered tools in education has significantly disrupted academic practices, and showed red flags, causing negative outcomes (Van Niekerk et al., 2025 ; Fitra et al., 2025). Students' over-dependence on AI tools incapacitates critical thinking, compromises data privacy, and encourages academic misconduct (Vieriu & Petrea, 2025 ; Bui et al., 2025). What is more, it poses concerns about ethical issues, originality (Leong & Zhang, 2025 ; Suryanto et al., 2025), as well as cognitive offloading, that can impair decision-making abilities (Alashab, 2026 ; Algwil,2025 ; Gerlich, 2025).

The drawbacks of AI powered tools lend ample weight to the necessity to take certain measures to mitigate their negative consequences in academic research. For instance, although instructors are mostly positive about AI applications in academia (Eljadedi, 2026),some educational experts stress the need for instructors to guide students in optimizing AI tools (Tokdemir, 2024), by building their technical

competence, increasing their awareness,and fostering their critical thinking (Nurchurifiani et al., 2025; Obaje, 2025).This requires teachers' use of appropriate teaching approaches, that encourage students' thoughtful and critical interaction with AI technologies (Gerlich, 2025), as well as using clear guidelines, and targeted educational efforts to tackle technical barriers, data privacy, and ethical dilemmas, particularly risks relating to plagiarism, authorship of AI-generated content, and diminished critical thinking resulting from excessive dependence on AI tools (Alashab,2026 ;Huong & Dao, 2026; Raza et al., 2024). Others call for students to use a balanced strategy, combining AI tools with traditional search methods (Kwak, 2025 ; Gladwin, 2024), while cross-checking AI-generated content using textbooks, and feedback from peers (Sustaningrum & Haldaka, 2025). This accentuates the need for students to consider instructors' comments, which still continue to be vital for maintaining higher-order skills utilize, and at the same time emphasize the use of AI tools as supportive means, not as substitutions for human reflection, and intellection (Alashab ,2026). These precautions can guarantee the accountable application of AI tools in academic settings (Kumar et al., 2025 ; Vieriu & Petrea, 2025). Not only this, but they denote that AI tools complement traditional methods in the EFL classroom, yet entail a specific method for their use (Latef, 2026).

Various theoretical frameworks advocate the amalgamation of AI tools to strengthen students' cognitive abilities in critical thinking within academic research. To exemplify, the Technology Acceptance Model 2 of Venkatesh and Davis (2000) postulates that students are more likely to adopt technology when they perceive it as both useful and easy to use. Hence, as AI tools are advanced to genuinely support critical thinking, and promote research performance, students are more inclined to use them. Furthermore, the Cognitive Load Theory of Sweller (1988) proposes that by automating repetitive tasks, the use of AI tools can reduce mental strain, freeing up cognitive resources for deeper higher-level thinking. Moreover, the Social Development Theory of Vygotsky (1978) underscores the scaffolding of AI tools in building and fortifying students' critical thinking skills. Lastly, Bloom's Taxonomy (Bloom,

2010) accentuates advancing students' cognitive functions of analysis and evaluation, which AI tools can promote through tailored feedback, and targeted learning outcomes.

Methodology

Research Design

The study embraces a qualitative exploratory approach to examine students' perspectives on how they perceive the influence of AI tools on the development of their critical thinking abilities in their academic research.

Sampling and Participants

This study relies on convenience sampling, a method in which participants are selected based on accessibility, and availability (Makwana et al., 2023). While this approach is cost-effective, and saves time, it carries inherent bias, and confines the generalizability of findings (Golzar et al., 2022). The sample consists of 16 Libyan EFL MA female students at the Faculty of Arts and Languages, University of Tripoli, Libya. These students are assigned to submit academic research papers as part of their course requirements.

Data Collection tool and analysis procedure

This study uses a self-administered questionnaire, featuring 4 open-ended questions to explore how Libyan EFL MA students perceive the role of AI tools in supporting the development of critical thinking processes in their academic research. The questions are inspired by Haase's (2010) cognitive processes of critical thinking, subsuming the application, analysis, synthesis and evaluation of AI-content. Students' responses are analyzed through the thematic analysis approach of Clarke and Braun (2017). This method is widely used in qualitative research to identify, analyze, and report recurring themes within data, either inductively, or deductively (Kiger & Varpio, 2020). The analysis proceeds through six key phases of data familiarization, initial code

generation, potential theme identification, theme reviewing and refining, and report production.

Results of Data Analysis and Discussion

The analysis of Libyan EFL MA students' insights on how AI tools affect the development of their critical thinking in academic research reveal several recurring themes, pertaining to the cognitive processes central to critical thinking, such as applying, analyzing, synthesizing, and evaluating AI-driven content during the conduct of academic research.

Content application

Regarding the application of AI content in academic research, thematic analysis of students' responses discloses two main themes. The first theme highlights how students count on various AI applications in all stages of their academic research. They see these tools as personal academic assistants, that help them identify suitable writing structures, summarize key points, and analyze relevant studies, thereby deepening their understanding of research topics. This result coincides with some previous findings, which report that students use a diversity of AI tools, like QuillBot, ChatGPT, Grammarly, and other AI applications, as virtual tutors, and digital assistants during the writing process (Algwil, 2025 ; Kim et al., 2025). Primarily, students employ these tools to research ideas, organize content, conduct and synthesize literature reviews, interpret data, and assist with editing, revising, and preparing work for publication (Alashab,2026 ; Nurchurifiani et al., 2025; Madanchian & Taherdoost, 2025 ; Arar et al., 2025).This result also supports earlier research, which underscore the positive role of AI tools in idea generation, content structuring, and automated summarization (Alashab,2026 ; Tokdemir, 2024; Khalifa & Albadawy, 2024).

The last theme centers on students' realization of the efficacy of AI tools in enhancing their learning through constructive, personalized feedback on recurring errors. In this context, students see AI tools as valuable academic assets (Alashab,2026 ; Vieriu & Petrea, 2025 ;

Khairuddin et al., 2024), strengthening their analytical skills in research. Practically, students' willingness to use these tools appears to be shaped not only by practical considerations, such as perceived utility, and ease of use, but also by emotional drivers, like enthusiasm for technology, and the engomment resulting from using it, which together guide their research efforts (Elhawaz & Bagigni,2026 ;Cui, 2025; Madanchian & Taherdoost, 2025).These results align with several study outputs, which display that interacting with AI tools promotes self-directed and active learning, while improving writing abilities through timely, tailored responses, and adaptive learning support (Elhawaz & Bagigni,2026 ; Aguado-García et al., 2025; Zitha et al., 2025; Hassen, 2025).

Content analysis

Concerning the analysis of AI content relevance before including it in academic research, thematic analysis of students' responses unveils two key themes. The first theme deals with the use of AI tools to search literature relating to their research topics. Here, students report using platforms like Google Scholar and ResearchGate to filter out AI-processed information against original sources in order to kemp their work plagiarism-free, and to ensure precision. They also seek the assistance of AI tools in locating relevant theories, identifying conceptual connections, and receiving suggestions for relavant models. Furthermore, students find these tools quite practical in uncovering knowledge gaps, building logical explanations, clarifying complex topics, and improving coherence in literature reviews. All these opinions are consistent with the study findings, which specify that students appreciate AI tools for streamlining literature reviews by saving time, increasing efficiency, and boosting engagement with suitable materials (Maeyouf & Dredi, 2026 ; Huong & Dao, 2026 ; Vieriu & Petrea, 2025). Similarly, they indicate that there is a positive link between postgraduates' regular use of AI tools, and strong analytical critical thinking skills (Gerlich, 2025).

The final theme focuses on students' discernmen of the accountable use of AI tools to warrant relevance and accuracy, emphasizing the

importance of critical evaluation, and content verification. In this regard, students mention that they manually assess and confirm the relevance of AI-driven information by thoroughly examining original sources. They particularly do this due to concerns about ethics, authorship, data privacy, and academic integrity (Doskaliuk et al., 2025 ; Floris & Renandya, 2025 ; Melisa et al., 2025). This outcome stresses that such applications are productive, yet they have to be employed cautiously to guarantee accurate, and trustworthy student-centered evaluation practices (Maeyouf & Dredi, 2026).

Content synthesis

Considering the usage of AI tools in content synthesis, thematic analysis of students' responses highlights three themes. The first theme concerns students' application of multiple AI-tools for idea synthesis in their academic research, counting on ChatGPT, Grammarly, and Gemini to strengthen and refine their arguments, and combine insights to support their reasoning. This result is in agreement with the study findings, which clarify that such student practice leads to compelling evidence development, argument organization, and feedback integration (Black& Tomlinson,2025 ; Bui et al., 2025 ; Fitra et al., 2025). This attests students' growing confidence and trust in the capacity of AI tools in cultivating grammar, enriching vocabulary, and fixing structure, coherence, and flow of their academic writing (Latef, 2026 ; Zeki et al., 2025 ; Ghafar & Raheem, 2025).

The second theme touches on the value of AI tools in identifying research gaps, and formulating research questions. In this vein, students believe in the ability of AI tools in rapidly analyzing existing literature, facilitating brainstorming, and pinpointing areas demandons extra elaboration. In practice, students' active engagement in the synthesis process promotes their creation of well-crafted questions, that can be answered through empirical investigations, eventually contributing to robust research designs, and higher-quality outcomes (Elhawaz & Bagigni, 2026 ; Mackey, 2024).

The final theme tackles students' dependence on AI tools in establishing logical reasoning in their academic research via the organization of

thoughts, presentation of supporting evidence, and improvement of discussion. This result resonates with the study findings of Bokan et al. (2025), which verify that students, who make use of AI tools in their academic research exhibit rigorous problem-solving skills, and more advanced logical thinking compared to those who do not. Moreover, this output denotes that AI tools augment students' data interpretation abilities, and comprehension of challenging academic material, leading to measurable gains in analytical reasoning (Suryanto et al., 2025).

Content evaluation

Commenting on evaluating the credibility of AI sources, thematic analysis of students' responses displays two themes. The first theme focuses on students' recognition of the limitations of AI tools in academic research. For instance, students admit that AI tools lead to the production of inaccurate and misleading outputs. This result agrees with the study findings of Mackey (2024), accentuating that although AI tools can summarize studies, and suggest research instruments based on similar applications, they often fail to provide proper citations. Thus, students verify AI- sources with regard to author information, and publication details, using academic databases, and reputable journals. In essence, this view denotes students' awareness of the ethical and academic risks tied to overreliance on AI tools (Tokdemir, 2024). More importantly, this view raises alarms concerning the reliability of AI-generated content, and the likelihood for students to develop over-confidence in incorrect AI content (Elhawaz & Bagigni, 2026).

The last theme highlights students' implementation of a balanced approach, integrating AI tools with conventional research practices, such as using Google Scholar, to confirm accuracy, and trustworthiness in academic research. This indicates that human judgment remains essential for contextual understanding, and ethical decision-making, to maintain academic standards, and bolster learning (Alashab, 2026 ; Farber, 2025 ; Khalifa & Albadawy, 2024). Specifically, the preferences for traditional methods emerges with students stating that despite using AI tools, they opt for reading, and analyzing original journal articles directly. This reflects that there are positive and negative perceptions regarding AI tools among students toward AI

tools. Such attitudes contribute to greater interest, and confidence in using such tools, especially when paired with AI literacy, and conventional research practices (Elhawaz & Bagigni, 2026 ;Bewersdorff et al., 2025). This stems from the fact that overdependence on AI tools can hinder rulings about the originality of academic research (Doskaliuk et al., 2025 ; Martín-Moncunill & Alonso Martínez, 2025), and lead to diminished intellectual capacity (Algwil, 2025 ; Black & Tomlinson, 2025).

Conclusion

Analogous to the findings of local and international studies executed on the AI implementation in academia, the current study presents mixed student insights about the interplay between AI tools, critical thinking processes, and academic reseach. The study manifests positive perceptions on how AI tools activate Libyan EFL MA students' cognitive process associated with critical thinking in academic research. These insights attest that harnessing AI tools as supportive resources rather than substitutes for independent thought makes students produce high-caliber academic research. Students exercise prudence with the incorporation of AI tools ,yet they safeguard academic integrity in their academic research, and abide by ethical rules. They believe that these tools can help connect critical thinking in academic research, advancing their cognitive abilities to apply, analyze, synthesize, and evaluate AI-content more effectively. Concurrently, the study shows that students are cognizant of the risks associated with the excessive usage of AI tools, like offloading, academic misconduct, and plagiarism. As a result, they approach AI tools with caution, via cross-checking AI sources, and using traditional research practices. These insights comply with the principles of the Technology Acceptance Model 2, which propose that students adopt AI tools based on their perceived usefulness, and easiness. They also align with the foundations of the Cognitive Load Theory, as AI tools can reduce mental strain by handling routine tasks, freeing students to engage in deeper cognitive processes. Furthermore, the study insights reflect Vygotsky's Social Development Theory through scaffolding, where AI tools cultivate critical thinking, amplify chances of personalized feedback. Lastly, the

study insights are consistent with the cognitive processes in Bloom's Taxonomy, since AI tools are thought to promote higher-order skills, such as analysis, and evaluation.

The study advocates supervisors to encourage students to use AI tools responsibly, and to update their AI information literacy within academic settings. It also underscores the need for true experimental research to assess the efficacy of AI tools on developing students' performance of academic research. This would help educational policy-makers in Libya to design targeted AI-literacy programs for postgraduate students, to guarantee the ethical integration of AI tools in academia. However, it should be noted that the current study's small sample size, and usage of convenience sampling restrict the strength, and generalizability of its findings, as participants may not represent the wider student population. Hence, future research should target larger, randomly selected samples to gain more comprehensive insights into how Libyan MA students use AI tools to augment critical thinking in their academic work.

References

Aguado-García, J. M., Alonso-Muñoz, S., & De-Pablos-Heredero, C. (2025). Using artificial intelligence for higher education: An overview and future research avenues. *Sage Open, 15*(2), 21582440251340352.

Alashab, A. O. (2026). The Effectiveness of AI-Writing Tools (ChatGPT and Grammarly) in Enhancing Academic Writing among EFL University Students. *Faculty of Languages Journal-Tripoli-Libya, 1*(33),118-137.

Algwil, K. (2025). The importance of artificial intelligence writing tools in enhancing English writing of EFL students. *Faculty of Languages Journal-Tripoli-Libya, 1*(32),28-43.

Arar, K. H., Özen, H., Polat, G., & Turan, S. (2025). Artificial intelligence, generative artificial intelligence and research integrity: a hybrid systemic review. *Smart Learning Environments, 12*(1), 1-29.

Bewersdorff, A., Hornberger, M., Nerdel, C., & Schiff, D. S. (2025). AI advocates and cautious critics: How AI attitudes, AI interest, use of AI, and AI literacy build university students' AI self-efficacy. *Computers and Education: Artificial Intelligence*, *8*, 100340.

Black, R. W., & Tomlinson, B. (2025). University students describe how they adopt AI for writing and research in a general education course. *Scientific reports*, *15*(1), 8799.

Bloom, B. S. (2010). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Bokan, M., Abdimalikkyzy, J., Babaeva, A., Keldibekova, A., Makpyr, S., & Smagulov, Y. (2025). Enhancing Logical Thinking Skills of Future Informatics Teachers through Artificial Intelligence. *Qubahan Academic Journal*, *5*(1), 543-551.

Bui, T. T. G., Ngo, N. V. A., & Mai, D. H. (2025). Applying AI Tools to Enhance Argumentation Skills in Debate Activities for EFL Students. *International Journal of AI in Language Education*, *2*(3), 83-100.

Clarke, V., & Braun, V. (2017). Thematic analysis. *The journal of positive psychology*, *12*(3), 297-298.

Cui, Y. (2025). What influences college students using AI for academic writing? A quantitative analysis based on HISAM and TRI theory. *Computers and Education: Artificial Intelligence*, *8*, 100391.

Doskaliuk, B., Zimba, O., Yessirkepov, M., Klishch, I., & Yatsyshyn, R. (2025). Artificial intelligence in peer review: enhancing efficiency while preserving integrity. *Journal of Korean medical science*, *40*(7), 1-9.

Durette, B., Fournier, M., & Lafon, M. (2016). The core competencies of PhDs. *Studies in Higher Education*, *41*(8), 1355-1370.

Elhawaz, Z., & Bagigni, A. (2026). Transforming Vocabulary Acquisition: The role of using AI Tools among adult second language learners in

acquiring new vocabulary. *Faculty of Languages Journal-Tripoli-Libya*, *1*(33), 1-14.

Eljadedi, N. (2026). Libyan University Instructors' Perspective on Using AI Applications in English as a Foreign Language Teaching. *Faculty of Languages Journal-Tripoli-Libya*, *1*(33),63-83.

Farber, S. (2025). Comparing human and AI expertise in the academic peer review process: towards a hybrid approach. *Higher Education Research & Development*, *44*(4), 871-885.

Fitra, M. D. R., Putri, K. Y., Muchyidin, M. S., & Naf'ihima, F. A. R. (2025). The Use of AI as an Assistant of University Students for their Research Proposal. *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, *13*(1), 418-432.

Fitria, T. N. (2021, December). Artificial intelligence (AI) in education: Using AI tools for teaching and learning process. In *Prosiding seminar nasional & call for paper STIE AAS* (Vol. 4, No. 1, pp. 134-147).

Floris, F. D., & Renandya, W. A. (2025). Artificial Intelligence Tools for Research Writing: Practical Tips for Teachers. *Flora*, *29*(1),1-21.

Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. *Societies*, *15* (6), 1-28.

Ghafar, Z. N., & Raheem, B. R. (2025). Understanding EFL learners' academic writing problems and the benefits of artificial intelligence tools: A descriptive review. *Journal of Language and Pragmatics Studies*, *4*(3), 187-193.

Gladwin, O. (2024). Integrating AI into Education: Designing Pedagogies to Enhance Critical Thinking and Analytical Skills. *Educational Technology Journal. Article*, *10*,1-9.

Golan, R., Reddy, R., Muthigi, A., & Ramasamy, R. (2023). Artificial intelligence in academic writing: a paradigm-shifting technological advance. *Nature reviews urology*, *20*(6), 327-328.

Golzar, J., Noor, S., & Tajik, O. (2022). Convenience sampling. *International Journal of Education & Language Studies*, *1*(2), 72-77.

Haase, F. A. (2010). Categories of Critical Thinking in Information Managent: A study of Critical Thinking in decision making processes. *Nómadas: Critical Journal of Social and Juridical Sciences*, *27*(3), 257-275.

Hassen, M. (2025). The impact of AI on students' reading, critical thinking, and problem-solving skills. *American Journal of Education and Information Technology*, *9*(2), 82-90.

Huong, L. P. H., & Dao, T. T. (2026). Ethical, Pedagogical, and Research Implications of AI Use in Education and Academic Research. In *Artificial Intelligence in Education and Academic Research: Opportunities, Challenges, and Ethical Issues* (pp. 211-220). Cham: Springer Nature Switzerland.

Khairuddin, Z., Ismayatim, W. F. A., Ismail, O., Rahmat, N. H., & Zamri, N. A. (2021, December). Exploring critical thinking in writing. In *International Conference on Sustainable Innovation Track Humanities Education and Social Sciences (ICSIHESS 2021)* (pp. 67-72). Atlantis Press.

Khairuddin, Z., Shahabani, N. S., Ahmad, S. N., Ahmad, A. R., & Zamri, N. A. (2024). Students' Perceptions on the Artificial Intelligence (AI) Tools as Academic Support. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, *9*(11), e003087.

Khalifa, M., & Albadawy, M. (2024). Using artificial intelligence in academic writing and research: An essential productivity tool. *Computer methods and programs in biomedicine update*, *5*, 100145.

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical teacher*, *42*(8), 846-854.

Kim, J., Yu, S., Detrick, R., & Li, N. (2025). Exploring students' perspectives on generative AI-assisted academic writing. *Education and Information Technologies*, *30*(1), 1265-1300.

Kumar, P. R., Subramaniam, N. K., & Yusof, S. M. (2025). A Comparative Analysis of Student Awareness, Trust, Usage, and Ethical Concerns Regarding AI Tools Across Academic Levels. *International Journal of Computer Applications*, *187*(59), 16-20.

Kwak, M. (2025). The Effectiveness of AI-Driven Tools in Improving Student Learning Outcomes Compared to Traditional Methods. *Issues in Information Systems*, *26*(4), 233-247.

Latef, H. (2026). The Importance of Using AI Tools in Learning Technical Writing Skills: Perspectives from IT Students at the University of Tripoli. *Faculty of Languages Journal-Tripoli-Libya, 1*(33),54-62.

Lawasi, M. C., Rohman, V. A., & Shoreamanis, M. (2024). The use of AI in improving student's critical thinking skills. *Proceedings Series on Social Sciences & Humanities*, *18*, 366-370.

Leong, W. Y., & Zhang, J. B. (2025). AI on Academic Integrity and Plagiarism Detection. *Learning*, *92*(12),1-9.

Mackey, A. (2024). Cautious optimism: AI and the research methods playbook. *Annual Review of Applied Linguistics*, *44*, 150-152.

Madanchian, M., & Taherdoost, H. (2025). The impact of artificial intelligence on research efficiency. *Results in engineering*, *26*, 104743.

Maeyouf, N., & Dredi, I. (2026). Postgraduate Students' Experience with Online and AI-Assisted English Testing at the Faculty of Arts and Langugaes: Tripoli University. *Faculty of Languages Journal-Tripoli-Libya, 1*(33),15-37.

Makwana, D., Engineer, P., Dabhi, A., & Chudasama, H. (2023). Sampling methods in research: A review. *International Journal of Trend in Scientific Research and Development*, *7*(3), 762-768.

Manoharan, G. (2026). Academic Research in the Age of Artificial Intelligence: A Revolutionary Look. In *Improving Doctoral Education and Research Development for Sustainability* (pp. 363-388). IGI Global Scientific Publishing.

Martín-Moncunill, D., & Alonso Martínez, D. (2025). Students' Trust in AI and Their Verification Strategies: A Case Study at Camilo José Cela University. *Education Sciences, 15*(10),1-16.

Melisa, R., Ashadi, A., Triastuti, A., Hidayati, S., Salido, A., Ero, P. E. L., ... & Al Fuad, Z. (2025). Critical Thinking in the Age of AI: A Systematic Review of AI's Effects on Higher Education. *Educational Process: International Journal*, *14*, e2025031.

Mohammadi, E., Thelwall, M., Cai, Y., Collier, T., Tahamtan, I., & Eftekhar, A. (2026). Is generative AI reshaping academic practices worldwide? A survey of adoption, benefits, and concerns. *Information Processing & Management*, *63*(1), 104350.

Nag, S. K., & Dwivedi, S. K. (2023). Critical Thinking: An Executive Trait of Cognitive Processing Efficacy of 21 st Century Learners. *Care List Journal, 12*(2),1-9.

Nurchurifiani, E., Maximilian, A., Ajeng, G. D., Wiratno, P., Hastomo, T., & Wicaksono, A. (2025). Leveraging AI-powered tools in academic writing and research: Insights from English faculty members in Indonesia. *International Journal of Information and Education Technology*, *15*(2), 312-322.

Obaje, T. A. (2025). Advancing Critical Thinking in Higher Education: The Transformative Role of Artificial Intelligence. *Interdisciplinary Journal of Economics and Business Law*, *14*, 254-271.

Parker, L., Carter, C., Karakas, A., Loper, A. J., & Sokkar, A. (2023). Ethics and improvement: Undergraduate students' use of artificial intelligence in academic endeavors. *International Journal of Intelligent Computing Research*, *14*(1), 1187-1194.

Raza, A., Shahroz, M., & Iram, A. (2024). Argumentation and AI: Bridging linguistic and technological perspectives in education. *Contemporary Journal of Social Science Review*, *2*(04), 1679-1690.

Suryanto, A. F., Wajdi, M., Sahoo, P. K., Wu, Q., Yusof, N. M., & Chan, Y. F. (2025). The impact of artificial intelligence on logic skills, critical thinking, and student creativity. *Journal of Language, Literature, Social and Cultural Studies*, *3*(3), 283-299.

Sustaningrum, R., & Haldaka, M. (2025). Student utilization and perceptions of AI technology for academic purposes: a mixed-method analysis. *Cogent Education*, *12*(1), 2553835.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive science*, *12*(2), 257-285.

Tahira, M., & Haider, G. (2019). The role of critical thinking in academic writing: An Investigation of EFL students' perceptions and writing experiences. *International Online Journal of Primary Education*, *8*(1), 1-30.

Terentieva, E., Zheltova, K., & Dukhanov, A. (2023). An Approach to Automate the Scientific Paper's Evaluation Based on NLP Technologies: the Experience in the Russian Segment of Financial Technologies Field. *Procedia Computer Science*, *229*, 294-304.

Tokdemir Demirel, E. (2024). The Perceptions of University Students Towards the Use of AI Tools For Academic Writing. *Innovations in Language Teaching Journal*, *1*(1), 1-20.

Van Niekerk, J., Delport, P. M., & Sutherland, I. (2025). Addressing the use of generative AI in academic writing. *Computers and Education: Artificial Intelligence*, *8*, 100342.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186-204.

Ventura, A. M. C., & Lopez, L. S. (2024). Unlocking the future of learning: assessing students' awareness and usage of AI tools. *International Journal of Information and Education Technology*, *14*(8), 1136-1144.

Vieriu, A. M., & Petrea, G. (2025). The impact of artificial intelligence (AI) on students' academic development. *Education Sciences*, *15*(3), 1-12.

Vygotsky, L. S. (1978). *Mind in society: Development of higher psychological processes*. Harvard university press.

Zeki, A. M., Tarshany, Y., Wasiq, S., Al-Taei, M. H. A., & Alhazmi, A. K. (2025). Exploring University Students' Utilization of AI Tools in Academic Assignments: Benefits, Challenges, and Ethical Considerations. In *2025 International Conference for Artificial Intelligence, Applications, Innovation and Ethics (AI2E)* (pp. 1-6). IEEE.

Zhao, X., Yin, H., Fang, C., & Liu, X. (2021). For the sustainable development of universities: Exploring the external factors impacting returned early career academic's research performance in China. *Sustainability*, *13*(3), 1-20.

Zitha, I., Masete, D., & Matsetela, S. (2025). Using Artificial Intelligence Tools for Providing Feedback as A Strategic Response to Addressing Challenges in Students' Academic Writing. *E-Journal of Humanities, Arts and Social Sciences*, *6*, 1096-1111.