RESEARCH ARTICLE

Objectivity in Research in the AI Era: Novice Researchers' Perspectives and Challenges in Algerian Academia

Anissa Mbata

Associate professor

English Language Department, Ingénierie des Formations et Montage de projets (IFMP) Laboratory, Naama University Centre

Algeria

Email: mbata@cuniv-naama.dz, ORCID iD: 0009-0004-1075-4081

Doi Serial https://doi.org/10.56334/sei/8.8.72

Keywords academic research; AI tools; novice researchers; objectivity

Abstract

In recent years, the integration of AI tools in higher education has become increasingly widespread. Hence, This paper aims to assess how such AI tools influence the novice researchers' objectivity in their writing practices. Thus, it adopts a mixed-methods approach in which data were analyzed using descriptive statistics and thematic content analysis, combining a survey with focus groups. The sample comprises (n=30) EFL postgraduate students. The findings consistently show that AI tools are predominantly used in problem-solving to sustain goal-setting, research planning, and data analysis. Furthermore, the findings support the idea that, when applied carefully, AI tools might be effective tools for EFL novice researchers by improving critical thinking, engagement, and decision-making. These AI resources support students' objectivity and autonomy. Nevertheless, this paper emphasizes the significance of designing institutional and pedagogical strategies that maintain academic integrity, foster critical engagement and promote impartiality in research with AI.

Citation. Mbata A. (2025). Objectivity in Research in the AI Era: Novice Researchers' Perspectives and Challenges in Algerian Academia. *Science, Education and Innovations in the Context of Modern Problems*, 8(8), 812–821. https://doi.org/10.56352/sei/8.8.72

Issue: https://imcra-az.org/archive/375-science-education-and-innovations-in-the-context-of-modern-problems-issue-8-vol-8-2025.html

Received: 17.03.2025 | Accepted: 10.06.2025 | Published: 16.07.2025 (available online)

Introduction

In the realm of scientific knowledge, examining objectivity in its definition, pursuit, and opposition in various historical, philosophical, and social contexts has been a long-standing topic of discussion, from empiricist dependence on reproducible evidence to rationalist notions of universal truth, from historical changes in scientific standards to contemporary worries about bias in data-driven research. However, with the advancement of science and technology, discussions on research have undergone continuous refinement, necessitating a more comprehensive understanding of the topic. Therefore, this paper explores primarily how AI challenges or reshapes notions of objectivity for novice researchers. This study draws on a sample of (n=30) of master's students and Phd students enrolling in their second and first year, respectively. The following questions are explored through a survey and focus group:

- How do novice researchers construct their understanding of objectivity?
- What is the role AI plays in shaping or distorting that understanding?
- What are the perspectives of novice researchers regarding objectivity in research with the integration of AI?

In any academic research, researchers adhere to a set of rules, standards, and practices that define its ethical boundaries, among which objectivity, integrity, and honesty are essential ones. This paper inverstigates whether AI-based science can produce objective knowledge or is inexorably influenced by social and human factors. Furthermore, In order to better prepare upcoming scholars for the changing demands of knowledge production in

the digital age, the study ends with recommendations for integrating critical thinking and AI literacy into research techniques programs.

Objectivity in Research

Objectivity, as a fundamental concept in research, has long been considered the backbone of any scientific inquiry, denoting the researchers' neutrality and detachment from their own biases. The concept has long been a subject of interest in the field of research philosophy.

Traditional positivist paradigms frame objectivity as the pursuit of 'an absolute truth' through empirical evidence and experimental data (the scientific method). However, this classical viewpoint has been criticized by different schools of thought and epistemic paradigms, mainly when the research explores unstructured data:

- Post-positivist theorists argue that complete objectivity cannot be attained, and that researchers must instead strive for transparency and reliability.
- Feminist epistemologists: Haraway (1988) introduced the notion of 'situated knowledge' to showcase the influence of social position on the epistemic perspective of the researcher (i.e., who, what and how to know), and Harding (2004) who proposes 'strong objectivity' that challenges the idea of a "view from nowhere" and emphasize the impact of positionality through the standpoint theory.
- Constructivist and critical paradigms which align with feminist theories of situated knowledge (Haraway, 1988; Harding, 2004) view knowledge and reality as socially co-constructed, where objectivity is not the complete absence of subjectivity, but a recognition of multiple viewpoints and perspectives.

Thus, in modern research, objectivity is increasingly understood not as an obsolete state, but as a value-driven and context-dependent practice that acknowledges the significant influence of values and context on the research methodology itself, requiring critical reflection and ethical awareness. Yet the ideal state of complete objectivity has always been challenged from Karl Popper's falsifiability (1959) to Thomas Kuhn's paradigm shifts (1962).

Therefore, several works have rejected the idea of pure, context-free objectivity, from Popper-Kuhn debate (1965) of paradigms and finally to feminist epistemologies like Haraway's and Harding's contribution. Rather, knowledge is becoming more widely recognized as partial, situated, and influenced by the knower's position in the world. This vision has introduced an epistemological and philosophical dilemma for AI design and implementation in research, a topic that has not gone unstudied in modern philosophy, through numerous queries, such as:

- How is true objectivity possible in AI?

- Whose perspective is implanted in the AI's training data and algorithms? And what ethical responsibilities do AI designers have?

- Can an AI comprehend or account for the social, cultural, or political contexts that shape knowledge?

- Is it possible to design AI systems that truly understand or reflect the complex, situated disposition of human knowledge?

Methods

This paper investigates the interplay between academic research writing and artificial intelligence (AI) tools by novice researchers (n=30 postgraduate students) enrolled in EFL Master's (M2) and PhD programs (1st year) at Ahmed Salhi University of Naama, Algeria. It aims to explore how these students utilise AI in conducting academic writing theses/articles, and assess the extent to which this use affects objectivity in research as its primary focus. The study involves a questionnaire and focus groups.

Thus, the sample in this study is selected through purposive sampling, comprising 30 female and male students. Quantitative and qualitative data have been collected through surveys and reflective responses, in which the questions are asked according to specific objectives, and each question is structured to suit novice researchers' experience with AI tools and their efforts to maintain objectivity and quality in academic writing, in order to:

- elicit data implicitly on the integration of critical thinking while using AI in their research
- explore the students' attitudes towards AI use in research
- Evaluate students' perceptions of objectivity in relation to AI impact.

The focus groups are added to deepen the understanding of the usage of those tools, to strengthen internal consistency between quantitative and qualitative data.

Survey Results

Question 01: How often do you use AI tools or applications in your academic writing tasks?

The following graph shows the frequency of AI use in thesis/dissertation/articles writing.

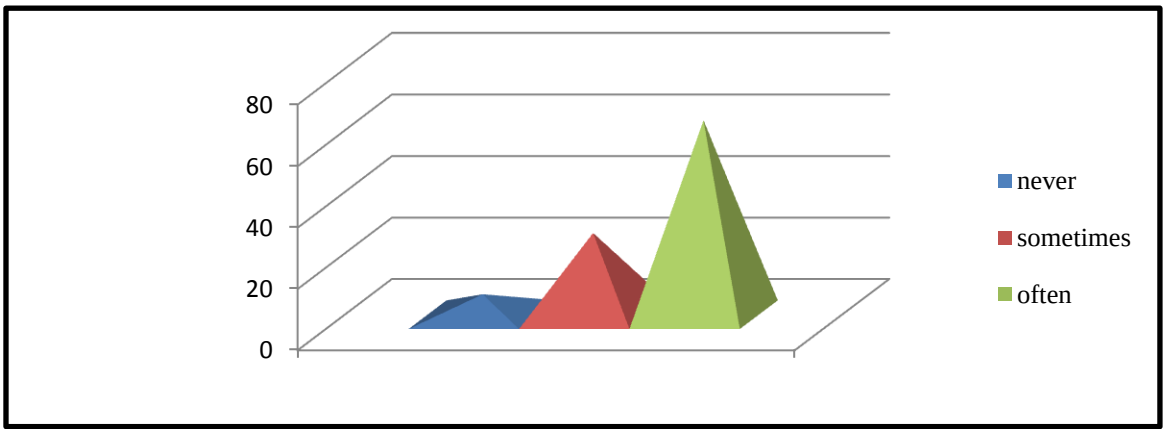

Figure 01: Frequency of AI Tool Usage in Academic Writing Tasks

According to the informants' responses, 63% of students often use AI assistant tools in their academic writing, whereas 26% use them sometimes but only 6% ensure that they never use them.

Question 02: What types of AI tools do you use in your research process?

The following tools/ applications are highly stated among students:

- Semantic scholar, Google scholar
- ChatGPT or other AI chatbots such as Gimini. Grammarly, Quillbot, Paperpal,
- Perplexity, Zotero, Mendeley, EndNote
- Bing AI

The majority of Master's students mention the free versions of the tools. However, the minority states that they do not use any tool.

Question 03: what challenges have you faced while using AI text generators?

The following graph shows the challenges that students face while dealing with AI text generators:

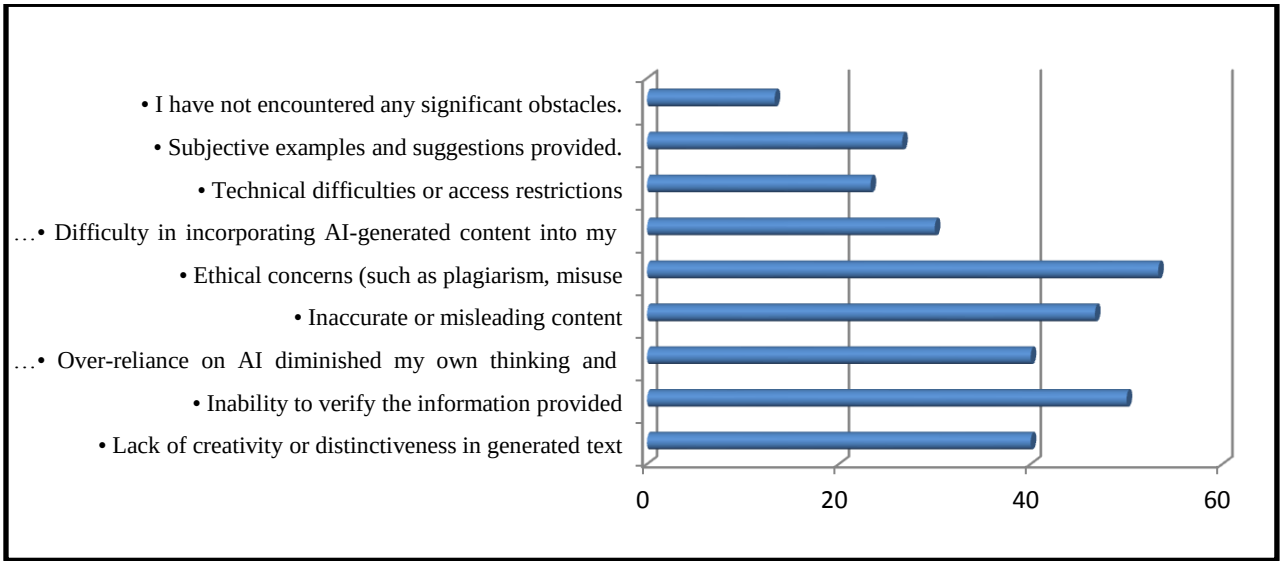

Figure 02: Challenges faced while Using AI Text Generators

The results suggest that the most generally noted challenges among postgraduate students when using AI in research are the lack of creativity or distinctiveness (60%),inaccuracy or content misleading (53.3%), and difficulty in verifying information (50%). Ethical concerns and over-reliance on AI were reported by 46.7% and 40% respectively. Technical and integration-related challenges were less commonly reported. Notably, only 13.3% claimed to have faced no significant obstacles.

Question 04: artificial intelligence (AI) tools improves the quality of my writing production (thesis/dissertation/articles)? how?

The following graph shows the students' attitudes towards AI's positive impact on research quality.

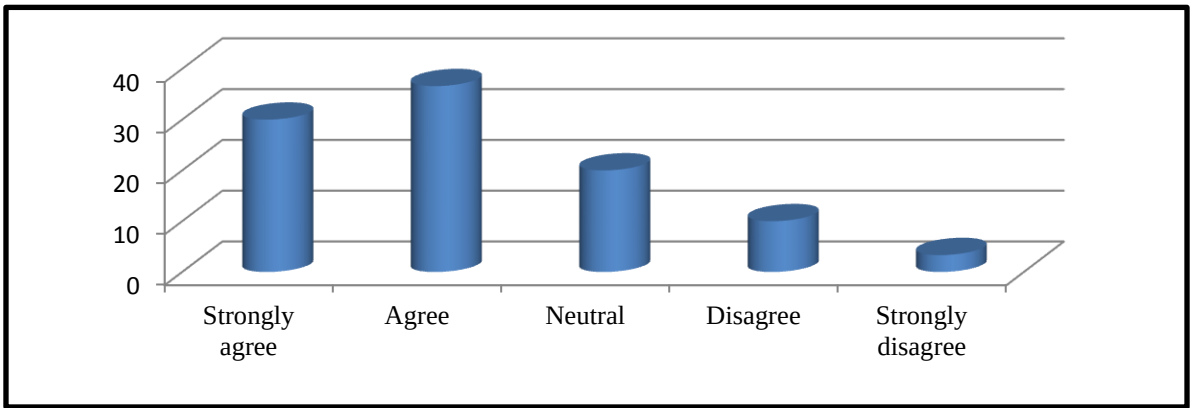

Figure 03: Students' Attitudes on AI's Positive Impact on their Writing Production

The bar-graph demontrates that a significant proportion (66.6%) of postgraduate students strongly agree or agree that AI has a positive influence on the quality of their research. The answers indicate an overall optimism toward AI tools as they are valuable for data analysis, writing assistance, literature review, automation, or as a proper ground of concepts. A meaningful number of students (20%) are uncertain or careful, expressing fear of over-reliance on AI. They use these tools, yet with limits, since various versions are paid and expensive. Only 10% disagree, and 3.33% strongly disagree, together forming a small minority. According to the answers, negative perspectives derive from several aspects, including lack of training or access restrictions, the high charge of necessary data-analysis softwares, and concerns about their research originality or academic integrity.

Question 05: What type of prompts do you use to get feedback from AI tools for your research/goals?

The majority of postgraduate students use AI tools to assess their work through specific prompts according to their goals. Some answers are stated as follows:

"I use it to identify grammatical mistakes, like: correct the structure or give the right structure", "I request it to verify the coherence and cohesion of my ideas", "I request it to evaluate the relevance of my ideas to the topic or research questions."

Others have reported that they request feedback from the AI on "*how to write a good and strong academic research plan", "I set my goals first, then I ask for elaboration or assessment", "I ask for arguments from other studies related to my own topic", "When I plan, examine, or evaluate my research process through AI assistant tools, I reach better results." " I ask like, I need the best software for corpus analysis."*

Question 06: Do you evaluate the credibility and relevance of the information provided?

The following figure illustrates whether students apply critical thinking by assessing and evaluating the relevance of AI-generated output.

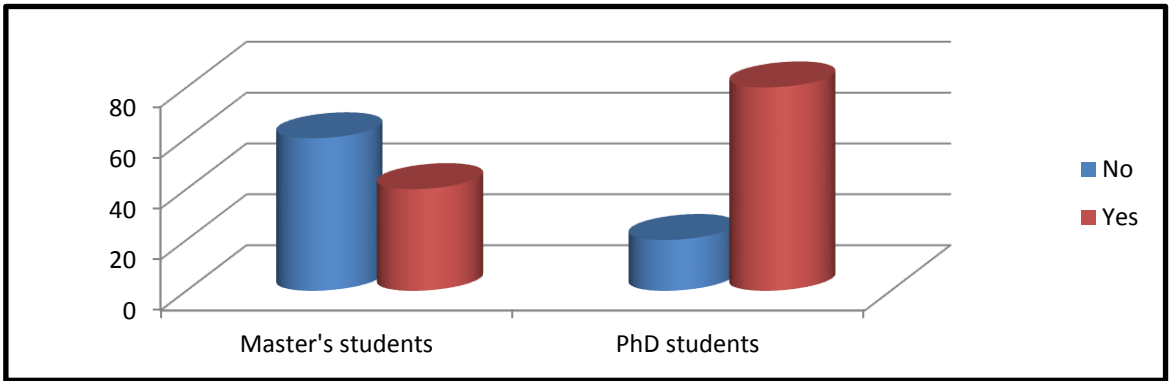

Figure 04: Assessment of Students' Critical Thinking in Reviewing AI Output

On the one hand, The majority of Master students rely on information provided by AI generators or tools, whereas the minority assesses the relevance of the content. On the other hand, among the phd students, the minority say 'no'. In contrast, the majority deny their dependence, assuming that they often evaluate the relevance of the information provided by AI.

Question 07: I actively modify (explain, develop, reflect) AI-generated output.

The bar chart highlights the extent of students' critical reflection on AI-generated material:

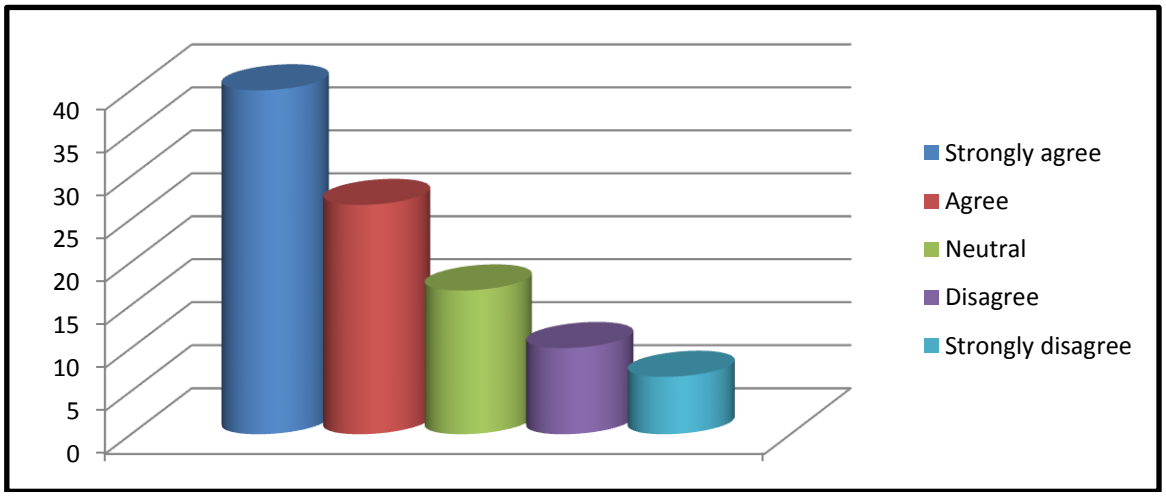

Figure 05: Postgraduate Students' Critical Reflection on AI generated Output

The question (07) implies a regular practice of critical engagement with AI tools, which includes active usage and modification of AI-generated content in addition to awareness (as in the preceding question). A significant indication of participatory rather than passive usage is the combined percentage of 66.66% (Agree + Strongly Agree) who actively participate in creating or improving AI results. Nonetheless, 16.7% of responses are neutral, indicating hesitant or unsure reactions. The 6.66% (Strongly Disagree) and 10% (Disagree) do not substantially alter AI result.

Focus groups Results

The study has opted for two groups of 7 and 8 male/female participants in each group. Six questions are explored in each session, which lasts approximately sixty minutes. The scope of the focus groups looks into how new researchers in Algerian academia, especially master's degree and early-stage PhD students, perceive and handle the idea of objectivity in their work. Additionally, it explores the effects of including AI technologies in the research process and how this might change students' conceptions of bias, neutrality, and epistemic accountability. The thematic analysis is stated in the following section.

Qu. 1: What does objectivity in research mean to you?

Through the discussion within both groups, the participants agree on some defining concepts of objectivity such as: neutrality, free of bias, honesty as in the following examples:

"[it] means putting aside all personal judgement, views and emotions"; "state what the data shows without falsifying them to confirm my viewpoints", "we don't let our beliefs interfere"; "give arguments in each step of the research process to show that your research is based on a solid background rather than personal assumptions"; "not being subjective"; "we cannot be fully objective, but we're trying"; "it's simply honesty".

There was a brief discussion about the nature of autonomy and subjectivity of the researcher. Many students claim, "When being autonomous, it means being subjective." However, others argue, "being ethical, critical, responsible, independent, leads to be objective", "we have to be objectively subjective."

Qu.2: In what stages of the research process are AI tools most useful or commonly used (e.g., literature review, analysis, writing)?

The table below summarizes the analysis of the informants' discussions:

Table 1: AI tools Suggested by Postgraduate Students

Stage	AI Use and utility	AI function	Example
Topic or issue exploration	highly used and useful	Brainstorming, refining queries, suggesting research questions and hypotheses	ChatGpt, Poe, Gemini
Literature Review	highly used and useful	Summarizing, outlining, keyword pursuit, and mapping relationships between key terms	ChatGpt , Google scholar, Semantic scholar, Perplexity
Methodology, Design and dat collection	highly used and useful	Suggesting methods, research tools, design types, designing survey questions	ChatGpt, Poe, Gemini
Data analysis	Low use	Statistical analysis, provide adequate softwares	SPSS (paid version), python

Drafting and Writing	Very highly used and useful	Generating and developing drafts, correcting /editing, and paraphrasing	ChatGpt ,Quillbot, Grammarly, paperpal,
Reference/ and bibliography	Moderate use	formatting support, bibliography	Zotero, ChatGpt Mendeley, EndNote

Note: It is noticeable that ChatGPT is a highly used tool in all stages of research.

Qu.3: Do you believe AI supports or threatens objectivity? How?

The discussion was carried out between highly supportive viewpoints and low critical perspectives, which are summarized as follows:

Table 2: Students' Attitudes on AI's Impact on Objectivity

Attitudes	Common key conepts	Students' sentences
AI Can Support Objectivity (High)	For AI: Consistency; no emotion, no tiredness, no mood, no beliefs	"AI doesn't have emotions.. AI won't let frustration or bias interfere in data or interpretation like human may do in a way or another"/ "AI never have a bad day or mood... or get bored or tired"/ "AI has no beliefs or religious attitudes"/ AI can maintain consistent decisions over time.. I sometimes lose focus in my longitudinal research"
AI Can Also Threaten Objectivity (Low)	For researcher: passive, Overreliance, no critical Judgment, human's use, awareness	relying so much on AI kills positive curiosity... human may stop questioning"/ " we must be aware... / AI is just a tool"/ "it calls for passivity" / "without our critical judgment... we risk ignoring some important details, opinions"

Note: Contractions and mistakes have been maintained to preserve the informant's original speech.

Qu.4: In your opinion, could depending on AI lead researchers to avoid critical thinking or ignore opposing evidence?

This probing question is intended to elicit a range of viewpoints from postgraduate (Master's and PhD) EFL students, including critical, nuanced, and supporting ones. Many students worry that artificial intelligence (AI) may result in mental passivity or overreliance, which would make it harder to examine or question whether it is being utilized appropriately (concepts include overdependence, inactive). Most of them contend that the application of AI—concepts like user control and researcher experience—determines whether or not it impacts critical thinking, rather than AI in se. Some students see AI as an addition to their thought processes, supporting drafts and brainstorming but not taking the place of critical thinking. (Concepts used include: Brainstorming aid, Drafting support). Some students point out that AI frequently gives general or biased responses, which can cause users to ignore opposing viewpoints or other arguments.

Some answers: *"it depends on how the researchers use AI... If we treat it like a guide, it's helpful. But if we copy-paste outputs, it kills critical thinking."/ "Actually, I feel that using AI helps me think critically... I treat the output as a draft and then analyze or modify it myself" / "AI usually gives generalized answers. If you don't critically engage with it, you might miss important counterarguments or conflicting studies". "To be honest, I used AI a lot in the beginning then realized I wasn't questioning things anymore... So now I only use it to brainstorm" "I feel like emm it's a double-edged sword. It can support critical thinking if used properly, but can also lead to superficial work if*

misused"/ "I don't think AI itself cause the problem, It's how lazy or rushed the user is"/ "If you're serious about your research, you won't skip critical thinking"/ "in contrast, it helps me at different levels, I see it as a time-saving device. It doesn't stop me from thinking critically"

(**Note**: Contractions and mistakes have been maintained to preserve the informant's original speech)

Qu .5: Could you suggest some strategies on how to employ AI tools more objectively and effectively in the process of academic research?

Participants' discussion reveals that AI tools are widely perceived as beneficial for academic research. Most of the participants suggest setting goals and being specific, for example, asking target questions (expand this sentence; correct the mistakes).

Other participants highlighted "avoiding the overreliance" and checking the information from their "original sources" by asking the AI for guidance or planning, and "not a direct full answer". Additionally, students suggest that "we should check our progress and self-reflection from time to time in order to know what is best for our research topic, problematics, interests, and needs, through brainstorming, drafting the plan, editing the guidelines, suggesting related studies, providing templates or by asking it to list the steps to follow". Others have stated that their strategies involve asking ChatGPT for arguments and examples related to the topic at hand. Others said that they write down the output as a draft in their style, then use Grammarly, QuillBot and ChatGPT for modification, argumentation, and resources. Disparities between Master's and PhD students also occur, notably concerning exposure to research ethics and epistemic confidence.

Qu 6: How should universities address the use of AI text generators in academic writing?

The discussions demonstrate that Master's students wanted workshops, policies, official statements and guidelines on AI use.They stressed the need for proactive instructions, rather than just punishment after misuse. Additionally, PhD Students also agreed, but emphasized flexibility and clear clarification of researchers' autonomy.

Discussion of findings

The analysis of data from both surveys and focus groups reveals that postgraduate students widely utilize AI tools for various degrees and purposes. The most commonly used tools are Chatbots and writing tools, mainly ChatGPT, Gemini, Grammarly, QuillBot and Perplexity. Those novice researchers integrate the AI tools in their dissertations, theses and articles at different steps. AI tools are most useful in the literature review, writing, and analysis stages of research, particularly in the context of thesis and dissertation writing.This is because theses and dissertations typically range from 60 to 350 pages, while academic articles or research papers are usually shorter with a typical length ranging from (3000-7000 words). Therefore, phd students do not rely heavily on AI when conducting their academic articles or research papers due to concerns about ethical standards and plagiarism.

The results suggest that the most generally reported concerns among postgraduate students (especially female ones) when using AI in research are about originality or distinctiveness in the content-based tasks provided by text generators, difficulty in verifying information, and ethical considerations. These concerns reflect a growing awareness of AI text generators (AIWTs) and their practical and valuable use, particularly among PhD students regarding their noticeable experience. In addition, concerns about the over-reliance on AI indicate that students are aware of potential academic integrity issues and the impact on their critical thinking skills. However, the minor technical and integration-related challenges, which were less commonly reported, imply that students are generally familiar with AI tools, but they face at least some level of difficulty, limitations and concerns when engaging AI in academic writing.

Moreover, the thematic analysis points out that postgraduate students are aware of both the risks and benefits of AI in academic work. Most concerns are related to overreliance and lowered depth of thought, especially among phd researchers. Kosmyna *et al.* (2025) conducted a neurocognitive study that found students using AI tools like ChatGPT exhibited reduced creative reasoning and executive function, indicating a form of '*low cognitive activity'* as highly problematic in the academic performance in general and research in specific, and impacts researchers' capacity to critically engage with information that leads to 'metacognitive laziness' (Fan *et al*, 2024). Nevertheless, this paper has tackled an implicit assessment of metacognitive awareness and prompts in research while using AI tools; the metacognitive cues have been reported as positive aspects in enhancing research objectivity and quality,

since they stand to be significantly effective while using traditional search engines (Zhou & Lam, 2019). Additionally, postgraduate students recognize their own role in either facilitating or hindering critical engagement when using AI in their academic research, where critical engagement with multiple perspectives is essential (Brookfield, 2012). However, investigating the positive impact of metacognitive prompts on enhancing critical thinking in generative AI search requires a more profound understanding (Singh et al., 2025).

Furthermore, findings imply that AI can effectively sustain critical thinking when used appropriately as a starting step rather than a final output. This perspective reflects learners' use of AI tools as scaffolding to develop ideas and purify arguments, but retain human reflection and oversight (Panit, 2025). Consequently, AI supports and enriches research objectivity when the researcher uses it critically; thus, the AI is not the problem, but rather the human's use.

Khan and Saravanan (2025) warn that AI-generated research content may appear objective but can subtly encourage conformity, bias, or manipulation, especially if users unquestioningly trust the outputs without cross-checking evidence. In this regard, the majority of students are aware of using AI Writing tools (AIWTs) as collaborators rather than replacements.

Based on the aforementioned paradigms in the literature review, AI must be scrutinized not only for technical accuracy, but also for the realities and values of what it represents, and what it excludes. This fact requires active critical thinking by researchers and users to question not only the outputs of AI systems but also what they reflect as assumptions, data sources, and design reasoning. Critical thinking becomes a crucial skill not only for analyzing AI outputs, but also for disclosing the sociopolitical aspects of AI systems and ensuring that their usage in research is consistent with different values, ethics and epistemic justice to account for diverse contexts.

Ultimately, findings highlight an urgent need to raise awareness about the ethical and academic implications of uncritical AI use; Thus, specific key implications should be assessed:

- **National legislation:** Algerian Order No. 1082 (2020) is the Legal framework which mandates detection, prevention, and penalties regarding plagiarism. https://www.wipo.int/wipolex/en/legislation/details/20554 ; However, no section or regulation tackles the AI policies, especially concerning what has been discussed in the topic at hand, such as, 'should the establishment of intellectual property (IP) policy be modified in response to AI evolution/ integration in academic settings? / What are the legislations regarding the AI data relevance?

- **Academic responsibility and awareness:** To maintain broader aspects of objectivity, honesty, and integrity, Algerian academia (universities/research laboratories) supports international/national conferences, workshops, and study days to raise students' awareness about the ethical considerations in research in the AI era, yet the legislative framework is always required besides Order (n1082, 2020). AI detectors and e-Libraries play an active role in reinforcing the responsibility.

- **Pedagogical strategy:** The Curriculum should emphasize the positive use of AI. Recently, Master's and PhD programmes have benefited from the integration of AI majors, as Free and Open Source Software, 'Programmation informatique'(Computer sciences), Artificial Intelligence, and Philosophy in social sciences (Ministry of Higher Education and Scientific Research March,/july, 2025). Indeed, the integration of philosophy, which enables students to be aware of different epistemic perspectives and paradigms, is a crucial addition to the PhD program in the field of language studies. Applications for the academic year (2025-2026) are currently being accepted Moreover, emphasis should be placed on teaching critical thinking skills to help students understand how to engage with AI content, fostering skepticism through analysis, evaluation, and reflection of AI products (Melisa *et al.*, 2025).

Conclusion

With the advent of AI tools, the attempt to show the boundary between objectivity and subjectivity in research is no longer required; instead, it presents an opportunity for collaboration to redefine decision-making within the objectivity-subjectivity continuum, thereby enhancing credibility in research. Therefore, there is a large agreement among philosophers, sociologists, and historians that objectivity is negotiated and contextualized within social, historical, and technological frameworks. This article demonstrates that AI tools can enhance objective decision-making through human critical thinking. Using metacognitive strategies can support the quality of research regarding the counterpart opinions. Thus, AI enhances research objectivity when used critically by researchers;

thus, the issue lies with human prompts and application, not AI itself. The concern therefore is not a matter of AI itself but its usage. The way the researcher uses AI tools influences the way those tools respond.

References

1. Chike, Anetoh. (2021). Karl Popper's Critique of Thomas Kuhn's Concept of Normal Science: An Evaluation. *African Journal of Social Sciences and Humanities Research*. 4. 105-115. 10.52589. https://www.researchgate.net/publication/353194388_Karl_Popper's_Critique_of_Thomas_Kuhn's_Concept_of_Normal_Science_An_Evaluation
2. Fan, Y., Luzhen, T., Huixiao L., Kejie S., Shufang T., Yueying Z., Yuan S., Xinyu L., and Dragan Gašević. (2025). Beware of Metacognitive Laziness: Effects of Generative Artificial Intelligence on Learning Motivation, Processes, and Performance. *British Journal of Educational Technology* 56(2):489–530. doi: 10.1111/bjet.13544 https://www.researchgate.net/publication/386649880_Beware_of_metacognitive_laziness_Effects_of_generative_artificial_intelligence_on_learning_motivation_processes_and_performance
3. Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, 14: 575–599.
4. Harding, S (ed.2004). *The Feminist Standpoint Reader*. New York: Routledge.
5. Khan , A and Saravanan, P. (2025). The Ethics of AI-Generated Content: Combating Bias and Misinformation in Generative Models. *Journal of Information Systems Engineering and Management.* 10(35), pp: 1226-1232 https://doi.org/10.52783/jisem.v10i35s.6292
6. Kosmyna, N, Hauptmann, E, Yuan, Y, Situ, J, Liao, X-Hao, Beresnitzky, A, Braunstein, I, and Maes, P. (2025). Your Brain on ChatGPT: Accumulation of Cognitive Debt when Using an AI Assistant for Essay Writing Task. 10.48550/arXiv.2506.08872. https://www.researchgate.net/publication/392560878_Your_Brain_on_ChatGPT_Accumulation_of_Cognitive_Debt_when_Using_an_AI_Assistant_for_Essay_Writing_Task
7. Melisa, R., Ashadi, A., Triastuti, A., Hidayati, S., Salido, A., Ero, P. E. L., Marlini, C., Zefrin., & Fuad, Z. A. (2025). Critical Thinking in the Age of AI: A Systematic Review of AI's Effects on Higher Education. Educational Process: International Journal, 14, e2025031. https://doi.org/10.22521/edupij.2025.14.31
8. Panit, Naneta. (2025). Can critical thinking and AI work together? Observations of science, Mathematics, and language instructors. Environment and Social Psychology. 9. 10.59429/esp.v9i11.3141.https://www.researchgate.net/publication/387757567_Can_critical_thinking_and_AI_work_together_Observations_of_science_Mathematics_and_language_instructors
9. Singh, A., Guan, Z., and Rieh, S.Y. (2025). Enhancing Critical Thinking in Generative AI Search with Metacognitive Prompts. 10.48550/arXiv.2505.24014. https://www.researchgate.net/publication/392314784_Enhancing_Critical_Thinking_in_Generative_AI_Search_with_Metacognitive_Prompts
10. Zhou, M., and Lam, K. (2019). Metacognitive Scaffolding for Online Information Search in K-12 and Higher Education Settings: A Systematic Review. *Educational Technology Research and Development* 67(6):1353–84. doi: 10.1007/s11423-019-09646-7