UDC 371.39
IRSTI 14.85.09
https://doi.org/10.48371/PHILS.2024.4.75.026

ON THE EFFECTIVE AND ETHICAL USE OF AI IN ACADEMIC WRITING

*Hartman Douglas K.[1]
*[1]PhD, Michigan State University, Michigan, the USA
e-mail: dhartman@msu.edu

Abstract. This paper investigates the ethical and effective application of generative AI tools in the realm of academic writing, specifically within the context of graduate education. The study, supported by TUBITAK, was conducted at Gazi University in Ankara, Türkiye, over a ten-week period and involved 24 graduate students. The research framework was structured around a five-phase new literacies model, encompassing the stages of questioning, locating, evaluating, synthesizing, and communicating. Each phase was supplemented by the use of specific AI tools, including Stormboard, XMind, ScholarAI, and Humata, to assist students in navigating the academic writing process.

A mixed-methods approach was employed, drawing on both quantitative and qualitative data to evaluate the intervention's impact. The quantitative analysis revealed a significant improvement in students' research attitudes, digital literacy skills, and academic writing self-efficacy, indicating a greater confidence in their scholarly abilities. Qualitative data, which includes video recordings, interviews, and written artifacts, is still undergoing analysis, with a hermeneutic approach planned for deeper interpretation.

The study's findings highlight the potential of AI tools to enhance academic writing skills and offer new insights into the integration of technology in higher education. This research contributes to the ongoing discourse on the role of AI in educational contexts and provides a framework for future studies in this area.

Keywords: artificial intelligence, academic writing, new literacies, digital literacy, literature review, intertextuality, education, learning

Introduction

Artificial Intelligence (AI) is rapidly transforming various academic disciplines, fundamentally changing the ways in which research is conducted, published, and disseminated. In this article, we explore our journey of integrating AI tools into academic writing within the context of higher education. Our project, which emerged from a collaboration between scholars at Gazi University in Ankara, Türkiye, sought to investigate how generative AI can be employed both ethically and effectively in academic settings. As an interdisciplinary team, we brought together expertise from diverse fields in education and embarked on a ten-week intervention with 24 graduate students, focusing on the potential of AI to enhance the academic writing process.

We centered our work on the *new literacies* framework, developed by scholar Donald J. Leu, which outlines a five-phase process: questioning, locating, evaluating, synthesizing, and communicating. We adapted this framework to guide our integration of AI tools into the academic writing curriculum, creating a structured yet flexible approach that allowed students to engage deeply with complex scholarly tasks. By aligning each phase of the process with specific AI

tools, we aimed to provide a comprehensive learning experience that balanced both the theoretical and practical aspects of academic writing.

In this article, we share an in-depth analysis of the methodologies we employed, the AI tools we utilized, and the preliminary findings of our study. Through a mixed-methods approach, we observed significant improvements in students' digital literacy, academic writing self-efficacy, and research attitudes. Our discussion not only highlights the transformative potential of AI in academic settings but also raises important questions about the ethical implications and long-term impact of these technologies on scholarly practices. As we reflect on our experience, we invite readers to consider how AI can be harnessed to support and enhance the future of academic writing.

To begin with, there is a question that is currently on the minds of many, particularly those involved in higher education who are engaged in publishing, conducting research, and seeking grant funding for both. The question is: how can we utilize a tool like AI—specifically generative AI—effectively and ethically in academic writing? This is indeed a pertinent question that occupies our thoughts and one that we must confront in the coming days.

To address this question, I spent six months in Türkiye, with generous support from TUBITAK, collaborating with colleagues at Gazi University. Together, we endeavored to design an initiative aimed at providing an initial answer to this complex question. In the following pages, I will organize my reflections into three main areas: first, I will discuss the context of the work we undertook; second, I will elaborate on the specific approach or intervention that we employed with graduate students; and finally, I will present some preliminary results. These three components will structure this discussion, offering insights into the work we accomplished. To describe it in a few words, the main work that we have been able to complete is creating a comprehensive scheme for using AI, a scheme that involves five consecutive stages organized in a linear way. That mental scheme will eventually allow the students to utilize AI effectively and, most importantly, in a proper way while doing their academic writing. The goal was to develop a scheme that would allow the students to become better academic writers, to organize their papers prominently, and to gain confidence in their respective fields.

Let us begin with the context. This project emerged as a result of collaboration with colleagues at Gazi University, located in Ankara, the capital of Türkiye. The project team, including myself, was composed of the following members:

- Prof. Dr. Douglas K. Hartman
- Prof. Dr. Hayati Akyol
- Prof. Dr. Mustafa Yıldız
- Doç. Serkan Düzgün

Although we come from diverse fields within education, we share a common interest in exploring how this new generative tool can be employed both ethically and effectively in academic writing. We worked with approximately 24 graduate students at Gazi University, meeting twice a week over a ten-week intervention. The

students came from various regions across Türkiye, as this map (Figure 1) indicates. This brief overview provides some context for our work.

Figure 1 – Participants of the project, regional dissemination

Methods and materials

In this study, a mixed-methods approach was employed to investigate the impact of AI tools on academic writing among graduate students. The intervention spanned ten weeks and involved 24 students from Gazi University in Türkiye. The new literacies framework, which includes phases of questioning, locating, evaluating, synthesizing, and communicating, served as the foundational structure for the intervention.

Throughout the process, specific AI tools were integrated into each phase: Stormboard and XMind for questioning, Google Scholar and ScholarAI for locating, Humata for evaluating, and various generative tools for synthesizing and communicating ideas. Data collection involved quantitative surveys assessing digital literacy and academic writing self-efficacy, as well as qualitative methods, including video recordings, interviews, and writing samples. Preliminary analysis indicates significant improvements in students' research attitudes and skills, with data still being analyzed using hermeneutic and interpretive methodologies.

Results and discussion

Now, let us delve into the approach we used. While the details of this intervention are extensive, I will focus on one particular aspect. This aspect relates to the work of a scholar named Donald J. Leu, whose research centers on a field known as new literacies [1]. I will explore this concept in greater depth.

In essence, the *new literacies* framework involves five phases. The first phase is *questioning*. When individuals engage in literate activities online, whether reading or writing, they often start with a question. We recognized this as analogous to the

research process: developing, formulating, and pursuing evidence-based answers to questions. Once a question is posed, there is a process of *locating* or searching for relevant literature. This literature is then *evaluated*, and during the evaluation process, some degree of synthesizing or integration begins.

How does one transform this into a literature review? Finally, there is the *communication* of this work. Communication can occur through writing, but it can also involve speaking or presenting the findings. This simple cycle, derived from the literature, is referred to as the new literacies process. We drew upon this framework to inform our thinking on how to use AI effectively and ethically in academic writing. We adapted this cycle into a more linear format, progressing from questioning, to locating, evaluating, synthesizing, and communicating—allowing those new to the academic writing process to perceive it as a step-by-step procedure (Figure 2).

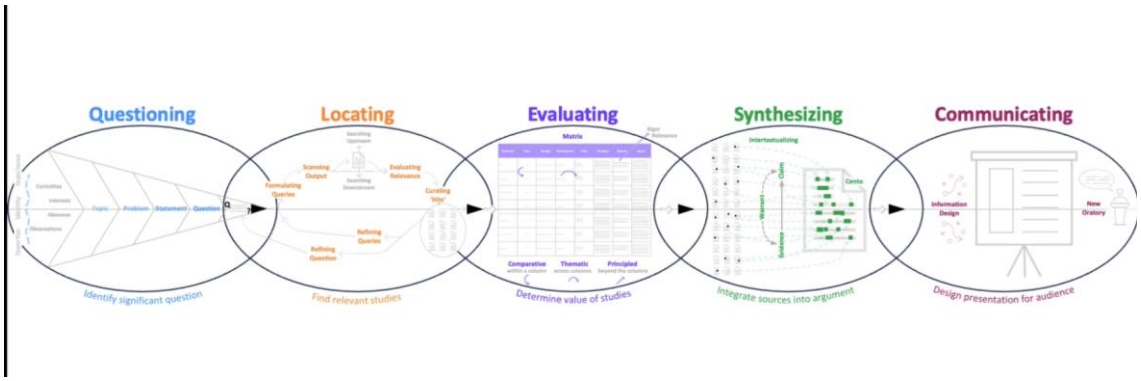

Figure 2 – The linear process of writing an academic work

However, this process was not strictly linear; it also involved iteration and recursion. In other words, while working on one phase of this five-phase process, participants might return to an earlier phase upon realizing the need for further learning or re-evaluating something previously understood. Thus, while the process was presented in a linear fashion, it was inherently recursive. At a general level, this process was quite detailed. While it may be challenging to visualize, I wish to convey that within each of these five phases, there was an underlying process, which we depicted visually.

We dedicated time not only to discussing the overall process in which the students were engaged but also to exploring what actions were necessary within each phase. Subsequently, we aligned each of the five phases of intellectual work with an AI tool. Below the five-phase process are examples of AI tools that we carefully examined, considering their utility and how to use them effectively and ethically. Although there were more tools than those depicted, this provides a conceptual understanding of our approach.

It is worthwhile to examine each of these phases in detail. For the questioning phase, we began by considering the students' lives, experiences, and expertise. This funnel-shaped diagram narrows down to the point where they develop a research question. Certainly, there is back-and-forth movement and recursion within this phase (Figure 3).

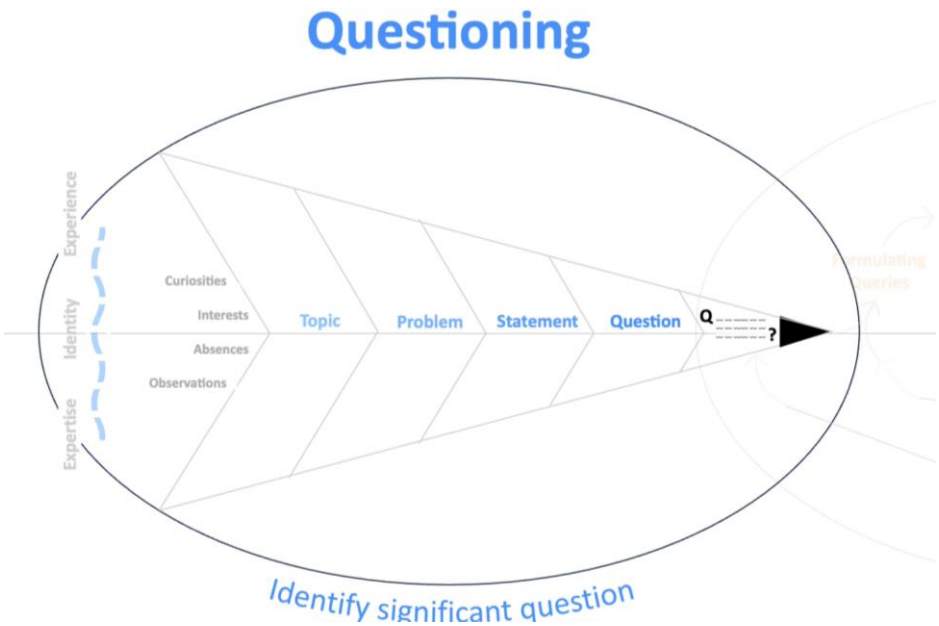

Figure 3 – The Questioning Phase

The questioning phase then transitions into the locating phase, characterized by a clockwise cycle in which students formulate questions, search, and archive relevant materials in EndNote. As they gain more knowledge, they generate different queries for further literature searches.

From the locating phase, students proceed to the evaluation phase, where they assess whether the material is relevant and rigorous (Figure 4). We provided extensive guidance on how this evaluation could be carried out.

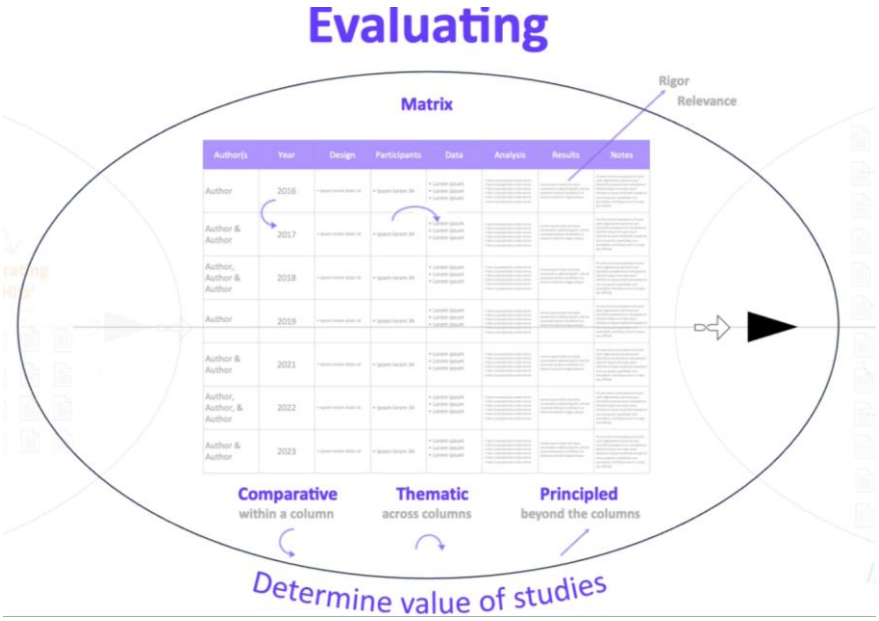

Figure 4 – Evaluating Phase

Following the evaluation phase, the process moves to synthesizing, where students begin to construct an argument—not merely reporting on the literature but integrating it into a coherent argument. Finally, they consider how to communicate their findings, not only through writing but also through oral communication and

presentations. Given time constraints, we focused primarily on oral communication of research and literature reviews.

This overview of the five-phase process and the associated details provides insight into our approach. I would now like to provide an example of some of the generative AI tools we utilized. For the questioning phase, we identified two particularly helpful tools: Stormboard and XMind. These tools proved invaluable for generating and refining scholarly ideas.

For the locating phase, we used several tools. Google Scholar was a central resource, as it has been indispensable in recent years. We also utilized databases available through our libraries, such as JSTOR. A newer tool we experimented with was ScholarAI, which was particularly useful because it avoids generating the kind of fabricated and phantom articles that other generative AI tools can produce. Another tool we employed was ResearchRabbit. All of this was connected to a tool for archiving articles and chapters, EndNote, which was provided by the university.

In the evaluation phase, we did not find an ideal generative AI tool for assisting students in critically engaging with the literature and identifying gaps. While tools like ChatGPT and Gemini can be somewhat useful, we aimed to help students visualize where absences in the literature might exist. However, we did find a powerful tool called Humata. This tool allows users to upload a PDF of an article and interact with it—asking questions, requesting more detail, or comparing it to other works. Although Humata comes with a cost, it is highly effective for engaging in dialogue with an article or set of articles, especially when seeking to identify gaps or areas of incongruence among studies.

In the synthesizing phase, we did not identify a particularly effective generative AI tool, though we anticipate that some may become available soon. We discussed the critical thinking required for synthesizing literature. It is not enough to simply report on the literature; one must construct an argument that demonstrates the significance and relevance of the research question and its potential to advance the field. We explored the concept of *intertextuality*, which involves weaving together resources into an argument. We also discussed the literature review as a "cento" or a patchwork of sources. The term "cento" originates from Latin, meaning patchwork, and a literature review is essentially a patchwork of ideas drawn from various sources.

I developed visuals to help the students understand that this patchwork is analogous to a literature review, which synthesizes ideas and resources from different sources. We then examined a literature review together, analyzing how it functions as a cento—an intertextual work that synthesizes other works. We focused on how arguments are formed and the language that signals this process. This exercise was particularly valuable as it allowed students to see how argument building is achieved.

In the final phase, communicating, we concentrated on how to present this work at conferences or in other professional settings. I will highlight a few tools we used. PowerPoint, for instance, now integrates AI features, allowing presenters to place themselves on the slide rather than being confined to a small corner. This feature is known as Cameo. Another tool we discussed was Copilot. Copilot enables users to

upload a paper, such as one intended for a conference, into PowerPoint, and it generates a draft presentation. While not perfect, it provides a solid starting point. If one's visual design skills require enhancement, this tool can assist in creating an initial draft of a presentation. This tool has recently become available, having only been released recently.

After discussing the context and approach, I would like to turn to the data we collected and discuss the preliminary results. Although we are still in the process of analyzing the data, I can share some early findings. This was a mixed-methods study, and we relied heavily on the work of Creswell to design the intervention [2].

Regarding our quantitative data, the analysis conducted thus far indicates that this AI-assisted academic writing intervention, structured around the five phases, had a significant impact on the research attitudes of the graduate students. It boosted their confidence, fostering a sense of "I can do this, and I want to do it."

The students' digital literacy skills improved markedly, and their academic writing self-efficacy—the belief that "I am a scholar, and these tools assist me in the scholarly writing process"—also increased.

As for the qualitative data, we collected video recordings, interviews, student writing samples, and other artifacts, including several surveys. This data is yet to be fully analyzed, as it will be processed in three phases: transcription, digital preprocessing of all documentation and artifacts, and finally, the interpretive analysis. We plan to employ a hermeneutic analytic process for this analysis.

In summary, this narrative provides an overview of our work on academic writing. While this is a condensed version of a much more detailed account, I hope it offers some valuable insights.

Conclusion

In conclusion, this study demonstrates the profound impact that AI tools can have on the academic writing process within higher education. By integrating AI within the framework of new literacies, the project at Gazi University provided a structured yet adaptable approach to guide graduate students through the complexities of scholarly writing. The five-phase process—questioning, locating, evaluating, synthesizing, and communicating—served as a foundational model that not only enhanced students' digital literacy and academic self-efficacy but also fostered a more confident and informed engagement with research practices.

The findings underscore the potential of AI to transform academic writing by offering tools that support each stage of the intellectual process. However, the study also highlights the importance of ethical considerations, particularly in ensuring that AI is used responsibly and does not undermine the integrity of scholarly work. While the initial results are promising, they also point to the need for further research, especially in understanding the long-term effects of AI integration on academic practices.

As AI continues to evolve, its role in academia will likely expand, making it imperative for educators and researchers to remain vigilant in balancing innovation with ethical stewardship. The insights gained from this project provide a valuable framework for future endeavors, emphasizing the importance of thoughtfully

integrating AI into educational settings to enhance, rather than replace, the human elements of scholarship.

REFERENCES

[1] Leu, D. J., Kinzer, C. K., Coiro, J., and Cammack, D. Toward a Theory of New Literacies Emerging From the Internet and Other Information and Communication Technologies // R. B. Ruddell & N. J. Unrau (Eds.), Theoretical models and processes of reading. 5th ed. – 2004. – P. 1570-1613.

[2] Creswell, J. W., and Creswell, J. D. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. – SAGE Publications. – 2017. – 270 p.

[3] Stormboard. (n.d.). Retrieved from https://stormboard.com

[4] XMind. (n.d.). Retrieved from https://www.xmind.net

[5] Google Scholar. (n.d.). Retrieved from https://scholar.google.com

[6] JSTOR. (n.d.). Retrieved from https://www.jstor.org

[7] ScholarAI. (n.d.). Retrieved from https://www.scholarai.com

[8] ResearchRabbit. (n.d.). Retrieved from https://www.researchrabbit.ai

[9] Humata. (n.d.). Retrieved from https://www.humata.ai

[10] Copilot by Microsoft. (n.d.). Retrieved from https://www.microsoft.com/en-us/microsoft-365/copilot

АКАДЕМИЯЛЫҚ ЖАЗУ БАРЫСЫНДА ЖИ-ді ТИІМДІ ӘРІ ЭТИКАЛЫҚ ТҮРДЕ ҚОЛДАНУ ЖАЙЫНДА

*Хартман Дуглас К.[1]

*[1]PhD, Мичиган мемлекеттік университеті, Мичиган, АҚШ

e-mail: dhartman@msu.edu

Аңдатпа. Бұл мақала академиялық жазу саласында, әсіресе магистратурада оқыту контекстінде генеративті ЖИ құралдарын этикалық және тиімді пайдалануды қарастырады. TUBITAK қолдауымен Түркияның Анкара қаласындағы Гази университетінде жүргізілген зерттеу он апталық кезеңді қамтыды. Жобаға 24 магистрант қатысты. Зерттеу құрылымы бес кезеңнен тұратын Жаңа сауаттылық моделіне негізделді: сұрақ қою, ақпарат іздеу, бағалау, синтездеу және қарым-қатынас. Әр кезеңде студенттерге академиялық жазу процесіне өтуге көмектесу үшін Stormboard, XMind, ScholarAI және Humata сияқты арнайы AI құралдары пайдаланылды.

Интервенцияның әсерін бағалау үшін сандық және сапалық деректерді қамтитын аралас әдіс тәсілі қолданылды. Сандық талдау студенттердің зерттеуге деген көзқарасының, цифрлық сауаттылығының және академиялық қабілеттеріне сенімділігінің айтарлықтай жақсарғанын көрсетті, бұл олардың зерттеу дағдыларына деген сенімінің артқанын көрсетеді. Сапалы деректер, соның ішінде бейнежазбалар, сұхбаттар мен қолжазбалар талдау сатысында, олар үшін тереңірек түсіндіру үшін герменевтикалық тәсілді қолдану жоспарлануда.

Зерттеу нәтижелері ЖИ құралдарының академиялық жазу дағдыларын жақсарту және технологияны жоғары оқу орындарына интеграциялаудың жаңа перспективаларын ұсыну үшін әлеуетін көрсетеді. Бұл зерттеу ЖИ-ның білім беру контекстіндегі рөлі туралы жалғасып жатқан пікірталасқа үлес қосады және осы саладағы болашақ зерттеулерге негіз болады.

Тірек сөздер: жасанды интеллект, академиялық жазу, жаңа сауаттылықтар, сандық сауаттылық, әдебиетке шолу, интермәтінділік, білім беру, оқыту

ОБ ЭФФЕКТИВНОМ И ЭТИЧНОМ ИСПОЛЬЗОВАНИИ ИИ В АКАДЕМИЧЕСКОМ ПИСЬМЕ

*Хартман Дуглас К.[1]
*[1]PhD, Мичиганский государственный университет, Мичиган, США
e-mail: dhartman@msu.edu

Аннотация. В данной статье рассматривается этическое и эффективное применение инструментов генеративного ИИ в области академического письма, в частности в контексте обучения в магистратуре. Исследование, поддержанное TUBITAK, было проведено в университете Гази в Анкаре, Турция, и охватывало десятинедельный период. В проекте приняли участие 24 обучающихся магистратуры. Исследовательская структура была основана на модели новой грамотности, включающей пять этапов: постановка вопросов, поиск информации, оценка, синтез и коммуникация. На каждом этапе использовались определенные инструменты ИИ, такие как Stormboard, XMind, ScholarAI и Humata, которые помогали студентам ориентироваться в процессе академического письма.

Для оценки воздействия вмешательства был применен смешанный метод, включающий количественные и качественные данные. Количественный анализ показал значительное улучшение исследовательских установок студентов, их цифровой грамотности и уверенности в своих академических способностях, что свидетельствует о возросшей уверенности в их научных навыках. Качественные данные, включающие видеозаписи, интервью и рукописи, находятся на стадии анализа, для чего планируется использовать герменевтический подход для более глубокого толкования.

Результаты исследования подчеркивают потенциал инструментов ИИ в улучшении навыков академического письма и предлагают новые перспективы по интеграции технологий в высшее образование. Это исследование вносит вклад в продолжающуюся дискуссию о роли ИИ в образовательных контекстах и предоставляет основу для будущих исследований в данной области.

Ключевые слова: искусственный интеллект, академическое письмо, новая грамотность, цифровая грамотность, обзор литературы, интертекстуальность, образование, учение

Received: November 11, 2024

Information about authors:
Douglas K. Hartman – PhD, Michigan State University, Michigan, the USA e-mail: dhartman@msu.edu

Авторлар туралы мәлімет:
Дуглас К. Хартман – PhD, Мичиган мемлекеттік университеті, Мичиган, АҚШ e-mail: dhartman@msu.edu

Информация об авторах:
Дуглас К. Хартман – PhD, Мичиганский государственный университет, Мичиган, США
e-mail: dhartman@msu.edu