Enhancing Academic Creativity: Co-Creation and Artificial Intelligence

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Abstract - The use of Artificial Intelligence (AI) tools has been shown to enhance the quality and originality of academic work when implemented responsibly and as a complement to traditional teaching. While some argue that their use could hinder the development of critical skills in students, recent literature suggests that with an appropriate pedagogical methodology, these tools have the potential to strengthen creativity and analytical thinking. The integration of AI assistants in higher education should focus on enhancing learning rather than replacing instructors. These tools should be used to automate mechanical tasks, freeing up time for developing higher-level cognitive skills. This paper proposes a framework for the structured incorporation of AI tools in the production of academic texts. It reviews the state of the art and presents a methodology based on co-creation between students and AI assistants. The ultimate goal is to leverage the potential of these tools while ensuring the holistic development of the skills necessary for academic excellence.

Keywords: Co-creation, Artificial Intelligence, educational innovation, higher education.

1. Introduction

The use of Artificial Intelligence (AI) tools has been shown to enhance the quality and originality of academic work when implemented responsibly and as a complement to traditional teaching [1, 2]. While some authors suggest that their use could discourage the development of critical skills in students [3], authors such as Thieberger & Wang (2021) and Cunningham (2023) emphasize that AI in education has the capacity to enhance learning and recommend using it to automate mechanical tasks, freeing up time for students to develop higher-level cognitive skills. With proper guidance, AI can drive the quality of academic work [4].

This article proposes a framework for the structured incorporation of AI tools in the production of texts in academic contexts. It reviews the state of the art and presents a methodology based on co-creation between students and AI assistants. The ultimate goal is to leverage the potential of these tools without neglecting the holistic development of the skills necessary for academic excellence.

2. Problem Statement

The production of academic texts presents significant challenges for students in higher education. These challenges include the need to demonstrate originality and critical thinking, the ability to coherently structure ideas and arguments, and the efficient management of information from diverse sources. Additionally, the recent proliferation of generative AI tools, while offering potential benefits, has also led to their unstructured and potentially irresponsible use by students, raising concerns about academic integrity and the development of essential skills.

Traditional teaching methods, rooted in established practices, often overlook the integration of AI tools, thus failing to harness their potential to foster creativity and critical thinking. In this context, there is a need for innovative approaches that can enhance the academic writing process and empower students to produce high-quality texts that meet the rigorous standards of academic discourse. The integration of AI tools, particularly AI-based writing assistants, offers a promising avenue to address these challenges and improve the overall quality of academic writing while ensuring ethical and responsible use.

3 Theoretical Framework

3.1 AI-Based Writing Assistants

AI-based writing assistants are tools based on natural language processing that support the writing and improvement of texts [5, 6, 7]. These applications, such as Grammarly and Hemingway Editor, offer language analysis, style, and grammar corrections [8].

There are also assistants focused on academic production, such as summary generators, automatic writing tools, and plagiarism detection [1]. For example, Resoomer summarizes information from extensive sources [9], while Jenni.ai and MyEssayBot assist in generating ideas and structuring content for essays [10].

These tools free up time for students to focus on developing critical thinking, providing examples that support the creation of quality academic work. However, their use should complement, not replace, traditional teaching [11].

The originality and quality of productions improve the advancement of knowledge [12, 13], so it is important to guarantee these attributes when using AI assistants [9, 10].

3.2 Quality Criteria in Academic Work

There are different attributes that allow evaluating the quality of academic work. Among the most relevant are the originality, coherence, relevance, precision, and depth of the content [14].

Originality refers to the work's ability to contribute novel ideas, approaches, or information to the field of study. Coherence evaluates the logic and organization of ideas. Relevance considers the pertinence of the work and its timeliness. Precision implies the accuracy of the data and its correct interpretation. Depth refers to the level of analysis and research conducted [15].

AI-based virtual assistants could enhance quality by helping to express ideas clearly and concisely, correcting errors, and strengthening arguments [16]. Similarly, web and mobile tools allow for generating original content for academic work [17].

However, it is important to note that the use of these tools must be informed, ethical, and responsible [17]. This implies that students must understand the role of AI tools as support for their own intellectual work and not as a replacement for it.

3.3 Description of the Innovation

This methodology, named **SHAPE**, after the first letter of each step, proposes a research-backed collaboration between students and AI tools to optimize the quality of academic writing [18, 19]. The methodology has the potential to foster creativity and originality while leveraging AI capabilities to improve writing quality and efficiency. The SHAPE methodology encompasses five key stages:

1. Specify topic and structure definition: Students should define the topic, objectives, and research structure based on questions, theoretical frameworks, and main sections [6].

   - Students define the research topic in less than one page.

   - Identify 2-3 research questions and 2-4 objectives.

   - Propose a tentative structure of 3-5 main sections.

2. Harvest information: Through guided searches using directories like AIFindy, students inquire about reliable sources to enrich their understanding of the topic [20].

- Conduct searches in academic databases using keywords.

- Select 5-7 most relevant primary sources.

- Extract and synthesize the key aspects of each source on one page.

3. <u>Articulate ideas:</u> Based on the research, students conceive their own analyses and findings to ensure an original contribution [21].

4. <u>Partner with AI</u>: At this point, students share their ideas with virtual assistants, requesting support in coherent and enriched writing of specific sections under close human supervision [10]. This stage may involve the following:

- Providing the AI assistant with a summary or outline of the key ideas and findings.

- Requesting the AI assistant to write or expand specific sections of the work.

- Reviewing and editing the text generated by the AI assistant to ensure accuracy, coherence, and alignment with the original ideas and findings.

- Requesting additional creative suggestions, alternative wording, or examples from the AI assistant to improve the quality and clarity of the work.

5. <u>Edit and Finalize:</u> Final editing. Students verify the quality of the work to ensure compliance with academic standards in content, format, and quality [18].

To verify that students have correctly followed all the steps of the proposed methodology, it is recommended to request the following evidence to reduce the risk of plagiarism and lack of transparency regarding the contribution of AI [18].

1. <u>Specify topic and structure definition</u>

- One-page document with the delimitation of the topic: It should include a brief description of the topic, research questions, objectives, and an outline detailing the 3-5 main sections of the work.

2. <u>Harvest information</u>

- Record of searches in academic databases: Screenshots, search records, or a research journal showing the keywords used and the directories consulted (e.g., AIFindy).

- List of selected primary sources: A document including the complete references of the 5-7 most relevant primary sources, indicating the key aspects of each, and explaining how each source contributes to the understanding of the topic.

3. <u>Articulate ideas</u>

- Document of analysis and own findings: A report detailing the original analyses, findings, and conclusions derived from the research, clearly differentiating own ideas from those obtained from the sources.

4. <u>Partner with AI</u>

- Text generated by the AI assistant: The specific sections of the work written or expanded by the AI, including the prompts used.

- Review and editing of the generated text: A document showing the revisions and edits made by the student on the text generated by the AI, with comments or annotations indicating the changes and justifications.

- Additional suggestions from the AI assistant: Examples of creative suggestions, alternative wording, or examples provided by the AI and how they were integrated or considered by the student.

5. <u>Edit and finalize</u>

- Final version of the document: The complete work, revised and edited to meet academic standards in content, format, and quality.
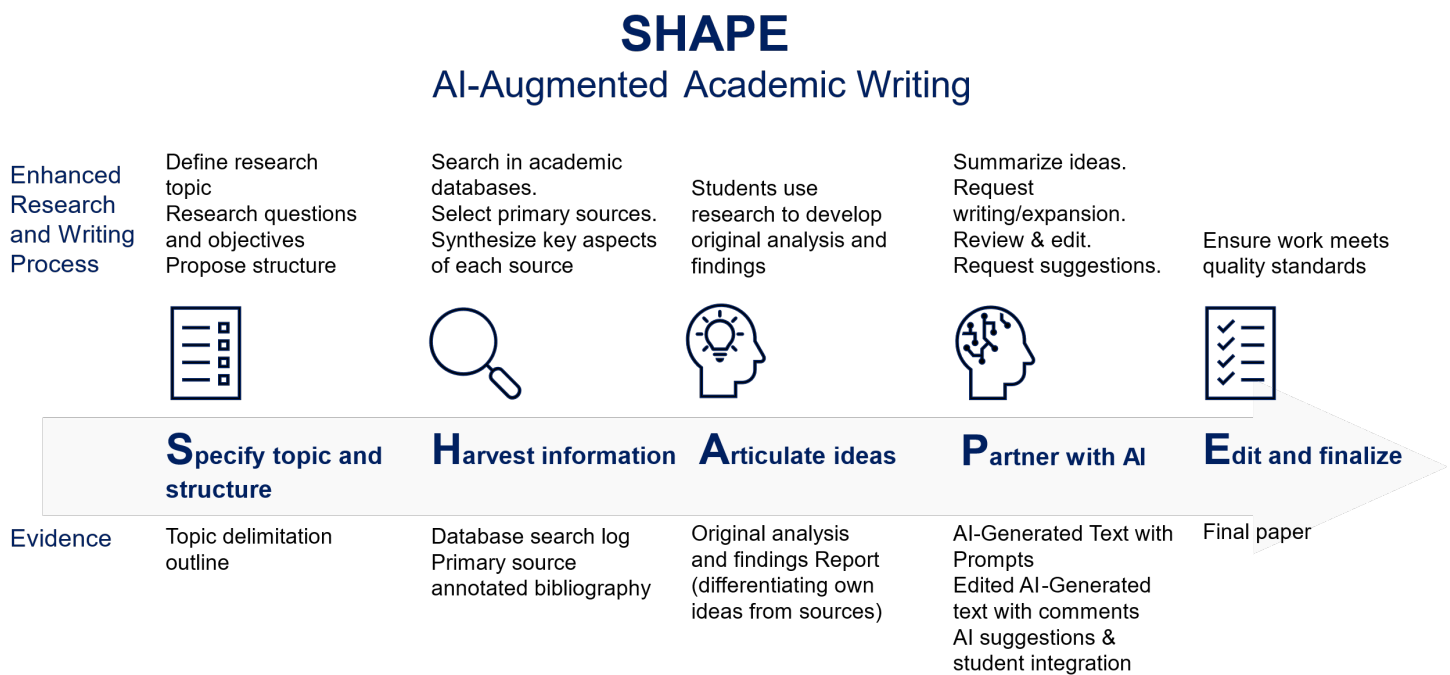

The SHAPE methodology is illustrated in Figure 1.

SHAPE
AI-Augmented Academic Writing

Enhanced Research and Writing Process	Define research topic Research questions and objectives Propose structure	Search in academic databases. Select primary sources. Synthesize key aspects of each source	Students use research to develop original analysis and findings	Summarize ideas. Request writing/expansion. Review & edit. Request suggestions.	Ensure work meets quality standards
	Specify topic and structure	**H**arvest information	**A**rticulate ideas	**P**artner with AI	**E**dit and finalize
Evidence	Topic delimitation outline	Database search log Primary source annotated bibliography	Original analysis and findings Report (differentiating own ideas from sources)	AI-Generated Text with Prompts Edited AI-Generated text with comments AI suggestions & student integration	Final paper

Fig. 1: AI-Augmented Academic Writing. Author's elaboration

3.4. Process of Implementation of the Innovation

Eighth-semester International Business students were asked to prepare an assignment using the described methodology. First, the methodology was explained to them, emphasizing the iterative nature of co-creation and the importance of guiding the AI towards the desired objectives. Once the students understood the task, the professor accompanied them in their co-creation process to resolve any doubts they might have while doing the exercise.

Upon completion of the task, students submitted it for grading and answered a brief survey about their perceptions and preferences regarding the use of AI for research activities. The results are shown in the next section.

3.5 Results

Similar methodologies have been employed in academia explored the use of AI assistants as co-authors in writing academic articles. Research suggest that this collaboration can improve the quality and efficiency of writing but also poses challenges in terms of control, responsibility, and ethics [10-13]

The results obtained from the implementation on this occasion can be grouped into two categories. Figure 2 summarizes the students' perceptions. As can be seen, most of them prefer to use AI tools over traditional teaching methods and consider that their level of engagement increases when performing activities that require interacting with AI, which coincides with the results of Kyritsi et al. [19], highlighting the potential to foster creativity and student participation.

It is observed that most students consider that the use of AI contributes to improving their critical thinking skills and their reflection and research skills, as Sethy et al. [15], point out in their research on the responsible use of AI.
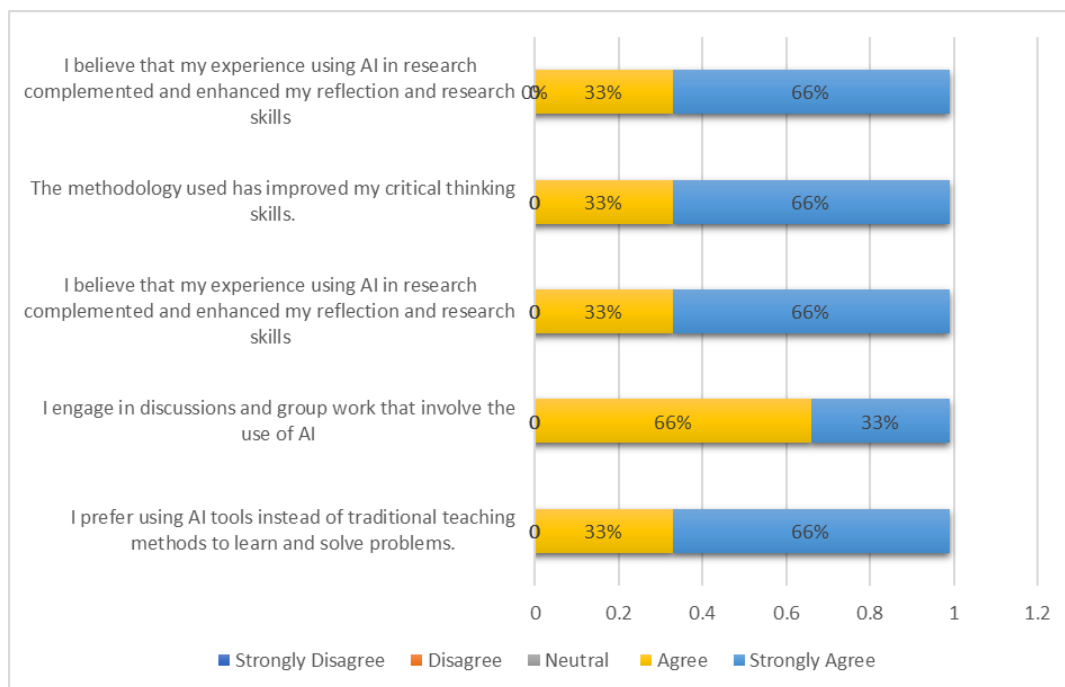

Fig. 2: Students' Perception of the Use of AI Tools.

The second category of results has to do with the quality of the submitted work. The submitted work showed an improvement in quality compared to previous submissions by the same students, which is consistent with previous studies that have shown that this type of methodology can optimize the quality and efficiency of writing [2,6,7].

3.6 Discussion

The results of this study indicate that the integration of AI tools in the academic writing process has a positive impact on both the quality of the output and the students' engagement levels. Most students preferred using AI tools over traditional methods, and they reported improvements in their critical thinking and research skills. These findings align with previous studies [22, 23, 24], which highlighted the potential of AI to foster creativity and participation among students.

However, while the students' work quality improved, several factors warrant consideration. First, the reliance on AI tools may lead to over-dependence, potentially hindering the development of critical skills, as suggested by Dong [25, 26]. It is crucial to ensure that these tools are used as enhancers rather than replacements for traditional cognitive exercises. This

underscores the importance of a structured approach to co-create, "keeping the human in the loop," as Ethan Mollick and others suggest [26], to critically evaluate, judge, and analyze AI results. Bringing their unique perspectives, critical thinking skills, and ethical considerations into play is essential.

Furthermore, the improvement in students' engagement and perception towards AI tools suggests a shift in educational dynamics. Students are becoming more adaptive to digital aids, which could transform traditional educational methodologies. This shift may necessitate teacher training programs to equip educators with the necessary skills to effectively leverage these technologies [27].

In comparison to traditional methods, AI tools offer a more interactive and engaging way to enhance academic writing. However, it is essential to provide proper training and set guidelines to balance the benefits of AI with the need for developing core academic skills. Future research should focus on longitudinal studies to understand the long-term impact of AI integration on academic performance and skill development.

4. Conclusion

Some critics argue that the quality of academic production cannot be assured solely through the use of AI-based writing assistants. It is argued that these programs can limit the actual development of language and critical thinking skills, which are fundamental to true academic excellence. Additionally, there is a risk of over-reliance on these tools and not exercising one's own judgment and analytical skills [22, 26].

However, empirical evidence shows improvements in the quality of work submitted by students and an increase in the level of student engagement when using AI tools for co-creating documents.

The methodology presented fosters the development of essential skills in students. It promotes rigor and systematic research. It also encourages critical thinking, as it forces students to critically evaluate information sources and effectively synthesize the most relevant data.

Furthermore, this methodology develops crucial information management skills. By using academic databases, students reinforce the search and use of reliable sources.

It also contributes to promoting originality and innovation. Encouraging students to generate their own analyses and findings teaches them to contribute meaningfully to existing knowledge.

Finally, the final review and editing of the work ensure that students learn to verify and ensure that their work meets academic standards in content and format. This stage of self-assessment and reflection on their own work allows them to identify strengths and areas for improvement, fostering a culture of continuous improvement and responsible use of AI.

It is recommended that institutions generate clear guidelines to guide the implementation of this methodology in the classroom [18]. For example, by establishing minimum requirements for autonomous student participation and review mechanisms that ensure the originality of the work. Similarly, it will be important to promote training initiatives and the exchange of best practices among teachers to enhance its benefits and adequately address the ethical challenges posed using AI [17].

5. Recommendations

The adoption of AI-based writing assistants in academic settings has generated considerable debate. Critics argue that relying on these tools could hinder the development of essential language and critical thinking skills, which are fundamental to achieving true academic excellence. They warn of a possible over-reliance on these technologies, which could undermine students' ability to exercise independent judgment and analytical skills [22].

However, empirical evidence presents a different picture. Studies show that the quality of student submissions has improved with the use of AI tools, as well as student engagement when these technologies are integrated into the learning process. This aligns with findings from previous research, suggesting that AI can improve both the quality and efficiency of academic writing [19].

The SHAPE methodology described in this document promotes the development of key competencies among students. It fosters rigorous and systematic research practices while encouraging critical thinking by requiring students to evaluate sources and synthesize relevant data effectively.

This approach also promotes originality and innovation by encouraging students to generate their own analyses and findings, contributing meaningfully to existing knowledge. The final review and editing stages ensure that students learn to meet academic standards in both content and format, fostering a culture of continuous improvement and responsible use of AI.

It is recommended that educational institutions establish clear guidelines on the use of AI. These guidelines should include minimum requirements for student participation and mechanisms to ensure the originality of the work produced. In this way, the balance between leveraging the potential of AI and maintaining rigorous academic standards can be effectively managed [17, 18].

Acknowledgements

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