

Artificial intelligence as a support for the academic writing process

Artificial intelligence (AI) plays an increasingly significant role in academia, particularly in the writing process. Sullivan et al. (2023) observe that AI is often discussed negatively in the academic context. They note that discussions focus on the dangers and unethical aspects of its use, such as cheating and the deterioration of learning, which may lead to a ban on the use of AI. Yet, when used correctly, AI can serve as a valuable partner, supporting writers at every stage of the writing process: from brainstorming and using sources to drafting, producing text, editing, and finalizing texts. However, if misused, AI risks replacing the writer's own thinking and suppresses their creativity. In this essay, we will examine how AI can support the writing process and how it can be used ethically and in a way that supports learning.

To use AI sensibly as a support for the writing process, one must first understand its operating logic and limitations. In this essay, we focus on generative AI, particularly AI applications based on large language models (e.g., ChatGPT and Copilot), which we refer to as AI. AI systems are not self-aware or capable of understanding their own messages (Lu et al., 2021). Language models, for example, are based on predicting the most likely next word based on a huge amount of data (Zhang et al., 2023). As a result, language models can hallucinate, i.e., come up with incorrect answers (e.g., Zhang et al., 2023; Wei et al., 2024). Based on these studies, it could be argued that the ideas produced by AI are not necessarily unique or knowledge-based, as they are based on highly repetitive writing patterns. It has also been reported that AI performs poorly in exams where reflection and creativity are required, such as mother tongue exams (see Yle.fi, 2023). On the other hand, Guzik et al. (2023) state that AI is also capable of creative activity. Therefore, the writer must always check the output of AI at all stages of the process. Next, we will look at how AI can be utilized at different stages of the writing process.

At the beginning of the writing process, AI can help with brainstorming and information gathering, for example. In the early stages, AI can be used to develop ideas, narrow down the topic, and make preliminary drafts and plans. At this stage, the writer can develop new perspectives and questions. AI can be particularly helpful when the writer is having difficulty getting started – it is easier to get started when one can directly edit an idea rather than starting from scratch (Buriak et al., 2023). In information retrieval, AI can streamline the process of finding and reading sources. AI applications are not suitable for primary information retrieval due to hallucinations, gaps, and biases, but applications designed for information retrieval, such as Keenious, can be used to support information retrieval (University of Jyväskylä [JYU], 2024a). In addition, AI can help with reading by, for example, creating summaries and word lists. However, the original text must always be read by the user, as it is impossible to be completely sure that the AI's interpretation is correct.

In later stages, AI can support text production, editing, and finalization. However, the final text must be produced or heavily edited by the user themselves for it to be considered their own. AI can help to create, for example, text structure and topic sentences (e.g., Buriak et al., 2023), and it can identify unclear sentence structures and make editing suggestions – in other words,

AI can be like an add-on to a word processor that speeds up the drafting process. On the other hand, AI can help edit a draft produced by the author themselves. At this stage, one can ask AI for feedback, which can then be used to continue working on the text (e.g., Dai et al., 2023). Finally, AI can help with the finalization of the text: AI can provide ideas for improving language accuracy, suggest corrections (e.g., Fitria, 2021), and correct source references and bibliography. Correction suggestions must also be viewed critically, as AI does not always understand the author's style or intent. When proofreading, AI may suggest awkward expressions or incorrect grammar.

AI can therefore be of significant benefit at all stages of the process, but its use in the writing process also raises many important ethical questions. Many universities prohibit or restrict the use of AI, even though many media sources say that AI should be integrated into teaching and assignments because it is a skill of the future (Sullivan et al., 2023). For example, the University of Jyväskylä (JYU, 2023) allows the use of AI, but teachers may prohibit it for justified reasons. Furthermore, AI is not allowed to be used as an academic source, and students are always responsible for the content of the text they submit and for reporting AI use (JYU, 2023).

Perhaps the most important aspect of ethical AI use is avoiding academic misconduct. It is therefore important to teach how AI can be used to support learning, not to cheat. For example, Buriak et al. (2023) emphasize that it is important to ensure that the content produced by AI is accurate and understandable. They also point out that text generated by AI must truly reflect one's thoughts, meaning that the use of AI must not replace one's own thinking and actions. This is the difference between ethical behavior and cheating.

In addition to avoiding fraud, the use of AI raises significant data protection and copyright issues that must be considered. For example, an AI user is always responsible for ensuring that they have the copyright or permission for the material they upload into the AI tools if the tool stores the inputs for use by the service provider (JYU, 2024b). In addition, they are responsible for not violating the data protection rights of others. It is not advisable to feed one's own personal data to AI, which may store and share it. From a copyright perspective, it is also not advisable to feed one's own unpublished text to an application that uses conversations for further training of AI. For example, the University of Jyväskylä uses Copilot, which does not use user input and always keeps data on a secure server.

Humans are always responsible for their work, even if they use AI to support the process. AI cannot be the author of a text because it does not have the ability to take responsibility. Therefore, agency and responsibility for content always remain with humans. The use of AI must also be reported to ensure transparency (JYU, 2023). The author must disclose which tool was used, how it was used, and for what purpose. In addition, they must explain how the outputs were evaluated and further processed. Presenting text generated by AI under one's own name is fraudulent, even if it is reported appropriately. Critical thinking in the use of AI and transparency in reporting is important in academic writing, where the author's originality and critical approach are central (e.g., Buriak et al., 2023).

At university, it is also important to consider what hinders and promotes learning, as learning is the primary purpose of university education. At its best, AI speeds up and deepens learning, but at its worst, its use can lead to cheating, so that one doesn't learn anything: if AI helps edit text, one can also learn about writing. If AI produces the text from start to finish, the "writer" learns nothing. AI can also be a problem at universities because cheating with AI is not as easily recognized as plagiarism (Sullivan et al., 2023). This is why students' responsibility for their own

learning is emphasized. Writing is thinking and learning, so it requires work and effort. Critical thinking skills may deteriorate if the only goal is to get a good grade and no effort is made to learn the content (Sullivan et al., 2023). Critical thinking is also needed to evaluate the benefits of using AI: sometimes using it is more time-consuming than not using it.

To summarize, it can be said that AI can be a valuable tool in the academic writing process, if it is used ethically and critically. It is important to understand that AI cannot replace one's own thinking or analytical skills. AI is developing rapidly and using it is a future – or even present - working life skill: it is important for everyone to understand at least the principles of how AI works. For this reason, AI should not be banned at universities, but its use should be taught. The primary responsibility for the ethical use of AI lies with the student, but the institution also has a responsibility. For example, the University of Jyväskylä offers a course that helps students learn how to use AI, and the university (JYU, 2023) has guidelines for the ethical use of AI in studies. In our view, the focus in teaching should be on critical thinking, and reflection on the ethical use of AI.

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The use of AI in this essay

We used artificial intelligence tools in our learning assignment: Copilot (fall 2024), ChatGPT (4o), Keenious (fall 2024), and ChatPDF (fall 2024). We used Copilot and ChatGPT to brainstorm ideas for the text, get a preliminary understanding of the topic before searching for information, requesting search terms, making a writing and reading plan, planning the structure, formulating research questions and search phrases, drafting, obtaining feedback, summarizing the text, and finalizing it.

We ensured the suitability and accuracy of Copilot and ChatGPT's suggestions by always critically evaluating their outputs and suggestions. We only selected good suggestions, which we then developed further ourselves. We worked on the ideas, suggestions, and text produced by Copilot and ChatGPT by editing and developing them further. We used the ideas and suggestions generated by artificial intelligence as a starting point for our own work, ensuring that the final text was our own creation. The actual writing and editing of the text were done by us.

We supplemented our information search with Keenious. We critically evaluated Keenious' suggestions based on our own expertise and selected sources that were suitable for the text. We conducted the actual information search ourselves.

We used ChatPDF to familiarize ourselves with the text, but we always read the original text as well to ensure that the AI's interpretations were correct.