

Artificial Intelligence in Academic Writing

- Point of view of the Scientific Council of Babeş-Bolyai University –

Cuprins

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Context

Artificial intelligence (AI) tools have been in use and accelerated development since the mid-twentieth century, coupled with the development of computers. Data analysis and complex problem solving with IIA have long been established in scientific research and beyond. More recently, especially since November 2022 (chatGPT launch), AI applications have also come into general use that can generate elements previously assumed to be the sole prerogative of human intelligence – written text, images, music, etc.¹⁻⁴ These generative IIAs (GenAI) are referred to in this text. In academia internationally, GenAI is already widely used, but largely chaotically and unregulated – for both legitimate and illegitimate purposes.

Reference institutions and organizations in the academic world have seen fit to regulate or at least make recommendations regarding GenAI in their activities. These recommendations/rules vary widely and are anticipated to evolve with GenAI's very dynamic field – from near-complete prohibition to citation use permission or others.⁵

The journal Science⁶ states that „Artificial intelligence (AI) AI-assisted technologies [such as large language models (LLMs), chatbots, and image creators] **do not meet the Science journals’ criteria for authorship** and therefore **may not be listed as authors** or coauthors, **nor may sources cited in Science journal content be authored or coauthored by AI tools**. Authors who **use AI-assisted technologies as components of their research study or as aids in the writing or presentation of the manuscript should note this in the cover letter and in the acknowledgments section** of the manuscript. Detailed information should be provided in the methods section: The full prompt used in the production of the work, as well as

the AI tool and its version, should be disclosed. Authors are accountable for the accuracy of the work and for ensuring that there is no plagiarism. They must also ensure that all sources are appropriately cited and should carefully review the work to guard against bias that may be introduced by AI. Editors may decline to move forward with manuscripts if AI is used inappropriately. Reviewers may not use AI technology in generating or writing their reviews because this could breach the confidentiality of the manuscript. **AI-generated images and other multimedia are not permitted in the Science journals without explicit permission from the editors.** Exceptions may be granted in certain situations—e.g., for images and/or videos in manuscripts specifically about AI and/or machine learning. Such exceptions will be evaluated on a case-by-case basis and should be disclosed at the time of submission. The Science journals recognize that this area is rapidly developing, and our position on AI-generated multimedia may change with the evolution of copyright law and industry standards on ethical use.”

The Elsevier publishing house⁷ states that „**Reviewers should not upload a submitted manuscript or any part of it into a generative AI tool** as this may violate the authors’ confidentiality and proprietary rights and, where the paper contains personally identifiable information, may breach data privacy rights. This confidentiality requirement extends to the peer review report, as it may contain confidential information about the manuscript and/or the authors. For this reason, **reviewers should not upload their peer review report into an AI tool**, even if it is just for the purpose of improving language and readability. Peer review is at the heart of the scientific ecosystem and Elsevier abides by the highest standards of integrity in this process. Reviewing a scientific manuscript implies responsibilities that can only be attributed to humans. **Generative AI or AI-assisted technologies should not be used by reviewers to assist in the scientific review** of a paper as the critical thinking and original assessment needed for peer review is outside of the scope of this technology and there is a risk that the technology will generate incorrect, incomplete or biased conclusions about the manuscript. The reviewer is responsible and accountable for the content of the review report. Elsevier’s AI author policy states **that authors are allowed to use generative AI and AI-assisted technologies in the writing process before submission, but only to improve the language and readability of their paper and with the appropriate disclosure**, as per our instructions in Elsevier’s Guide for Authors. Reviewers can find such disclosure at the bottom of the paper in a separate section before the list of references. *Generative AI is a type of artificial intelligence technology that can produce various types of content including text, imagery, audio and synthetic data. Examples include ChatGPT, NovelAI, Jasper AI, Rytr AI, DALL-E, etc.”

The present document provides the point of view of the Scientific Council of Babeş-Bolyai University (CS-UBB) and serves as (1) an internal norm in the evaluation and analysis activities specific to CS-UBB, but also (2) a collegial recommendation for use outside CS-UBB.

Training/education on the use of GenAI

In the technologically developed companies with which Romania is in partnership and/or competition, GenAI has been consolidating its status as a routine tool for some time now. There, GenAI must today be viewed on a similar level to other digital tools such as those in Office-type software packages. A person trained in the modern spirit of understanding the process of knowledge generation (i.e., familiar with the basics of research-development-innovation (RDI) processes) will either have to use GenAI or work collaboratively or competitively with GenAI users. It is essential that students and researchers/teachers are familiar with the basics of these technologies – i.e. the (constantly evolving and accelerated) capabilities, limitations and standards of responsible use specific to the scientific field in which they work. Training modules/seminars/laboratories are thus recommended in all fields, at all

faculties/institutes. The breadth and substance of these modules must be adapted to the specifics of the field to which they are addressed - from vocational fields where GenAI can be a central element of professional skills to some areas of experimental exact sciences where GenAI can be an occasional text correction tool (spellchecker).

With different speeds depending on the field/faculty, GenAI replaces or makes redundant stages or elements/processes previously inherent to the activity in the field – processes that in some cases even had dedicated specialists. In parallel, GenAI can bring the emergence of new sub-specializations. Both instructors and trainees need to be aware of and prepared for these changes.

GenAI in Knowledge Generation- CDI

In the vocational fields of the arts, there is already a direction of activity in which GenAI is a *main* tool of activity – whether it is the generation of music, text or image, or the development of algorithms that make them possible. Various other humanistic or social fields already have GenAI as a standard of activity not only in the academic environment but especially outside it. In some experimental and exact-science fields, especially where large volumes of data are operated, or when generating code in programming languages, GenAI is also a standard tool. On the contrary, in other fields GenAI is seen as an optional "autocorrect" or "spellchecker" tool, but not a central one or at least inherent to knowledge generation / RDI processes. It is essential to note that GenAI have sometimes been shown to provide completely fictional statements, theories, data, and bibliographic references. Therefore, documenting scientific topics with the help of GenAI can be risky if it is used blindly, without knowing the answers beforehand and/or without their subsequent documentation and verification.

GenAI in Academic Writing

Researchers and institutions at the forefront of knowledge today use GenAI in writing grant proposals, reports, scientific papers, etc. – responsibly and simplifying / streamlining the work. Such responsible use involves two coordinates: (1) avoiding/preventing the generation of false information/knowledge by abusing the generative capability of GenAI, and (2) transparent recognition of the use of GenAI. On the other hand, deficiencies in education or moral/professional standards also lead to the widespread use of GenAI for academic fraud – where authors do not give credit to the use of GenAI or even use GenAI to cover up other elements of fraud, such as false data generation or plagiarism. This problem is especially pressing in situations where the objective of the respective writing activity was to demonstrate the skills of reasoning / synthesis / critical thinking within a training or examination process. The responsible and efficient use of GenAI is impossible if users do not know what GenAI is trying to mimic/simplify.

In conclusion, it is inevitable to have two contexts of use of GenAI: (1) the incorrect ones, in which the central task is the testing/training of human elements related to originality, reasoning, critical analysis, etc. (and where GenAI can be a secondary tool but not the main tool – so its use has the potential for fraud on the part of the examined people) and (2) the one where already trained people use the GenAI to simplify tasks that for them have already become routine.

The word "routine" in the previous sentence is an essential one. Responsible scientific research is about understanding the difference between routine and originality. If today GenAI can write a synthesis paper on a scientific subject, then either (1) that synthesis is relatively routine and it is not the case for a person to make the effort to write it in a classical manner, or (2) it is an incompletely instructed synthesis

and therefore wrongly made. In both situations, it is not acceptable for those texts to be placed on equal footing with texts that meet the essential requirement of science – to push the frontiers of knowledge beyond routine.

GenAI, GDPR, intellectual property and responsibility

GenAI generally use data/information computing and storage platforms located outside the jurisdiction where standard academic users typically operate. User information, documents and data are therefore transferred to external entities with legislative limitations that are often unclear to users. From there, that information can circulate either behind closed doors or indirectly to other users in subsequent texts/creations of the same GenAI. For most applications, this is irrelevant, as it is trivial data/information. However, when it comes to GDPR data, or confidential/secret data of another nature, especially other than those of the user/operator, this element becomes problematic – the user risks violating rules or even laws related to privacy and/or intellectual property.

CS-UBB approach

CS-UBB occasionally manages project competitions for research funding. In these competitions, CS-UBB seeks excellence and the generation of frontier knowledge in a manner that avoids excessive bureaucracy – in other words, to reward knowledge generators while taking as little as their time as possible in the process. The funding applications at CS-UBB are therefore designed on the coordinate of excellence and efficiency – concise and rich in *substance*. In this spirit, GenAI's routine contributions have no place. **CS-UBB undertakes not to ask for or stimulate grant applications where GenAI is used for writing.** Of course, GenAI remains legitimate in these grants as a research tool or as subject in itself – and the ability to use GenAI in academic writing is in no way discouraged. Also, the use of GenAI in generic or summary texts – including popularizing science – may be acceptable. The usefulness of GenAI for niche scientific topics can vary greatly depending on the source/program. Thus, the most generally used GenAI are trained/calibrated on very general datasets/notions at a global level, which can be disadvantageous/problematic when used in a narrow field of knowledge or to a narrow/local sector of the public. On the other hand, some GenAI are well trained on narrow domains. Moreover, the ability of some GenAI (e.g. chatGPT) is already implemented to generate text based on documents integrated by the user, so the ability to provide correct statements is much higher. In any variant, regardless of the GenAI used, the statements must be passed / verified through the lens of the researchers who decide to use those statements.

For the generation of text in the evaluation processes (as "referent/evaluator/reviewer") CS-UBB will apply here the same principles as for the writing of grants.

Recommendations

1. In the opinion of CS-UBB, **scientific publications (and not only) must clearly differentiate between directly human-generated content and content generated with GenAI.** Both must be held to serious standards and in no way confused. Both may be meritorious, but each with its own usefulness. In the decision to write/publish, authors must consciously assume this differentiation. The illusion that scientific articles written with GenAI have the same value and are to be held at the same standards as those written before the GenAI era... should not be allowed to persist.

2. **If a scientific article text (especially in the introductory or discussion section) can be written by GenAI as well as by a human, then probably that text is not one that generates knowledge and should not be presented as a "scientific publication" but rather as a "popularization text".** When we write a scientific text intended for specialists, be it a project/grant proposal, article, or book, the rule must be this: at the frontier of knowledge, GenAI is not trained to operate, so it could not write this text; however, if we wrote that text with GenAI, it means that we have given up the ambition to place ourselves at the frontiers of knowledge, that is, to make RDI with a serious impact on the scientific field. Of course, "popularization texts" are also useful, necessary and sometimes of more serious impact than original contributions - as long as they are treated as such and not as scientific discoveries in themselves.
3. **From the point of view of training that involves skills in knowledge generation (a coordinate that in UBB's strategies is an inherent part of all types of activities, including didactics), GenAI is a subject that can find its place within the education for digital skills in all fields of science.**
4. In the GenAI era, the verification/certification of the originality and authorship of essays and papers as "homework" or evaluation stages (e.g., "doctoral papers") presents special logistical challenges, with which few institutions are equipped to deal coherently. Text originality verification tools today analyze not only plagiarism but also GenAI's contributions – but the degree of success of these checks is (and is expected to remain) unsatisfactory. Therefore, our recommendation is that, where teaching priorities require the use of **reports/essays as a method of evaluation**, additional methods of examination **on the reports should be used**, such as (1) **direct and interactive discussion** (not a simple one-sided "presentation") on the topic/ideas of the essay or (2) **writing the essay *ad hoc*, in written exam conditions**.
5. **The dissertations/diploma papers** include in many areas a section of original results generated by the students authors of these works. If they are truly original, then GenAI will have a minimal role. On the other hand, all papers include a "literature study" section, where covering/summarizing already existing knowledge is the ideal target for GenAI. With the right guidance and the right effort, it is also possible to write a truly frontier text - that is, one that is inaccessible to GenAI – but such an ambition is unsustainable for mass education. Here, too, as in the case of essays, the solution may be to accept the possibility of using GenAI and **shift the focus to discussion-type exams that require candidates to demonstrate knowledge of the things written in their final thesis**. For the bachelor's level, a solution adopted by some institutions/fields is to replace the graduation paper with actual exams; **However, it is essential that in such situations the skills inherent to a traditional bachelor's thesis (documentation, writing synthetic texts, applying theoretical notions to a complex concrete problem)** are among the targets achieved and evaluated during the educational process.
6. We propose that the academic documents of the RDI type (essay, article, dissertation, grant proposal, etc.) be classified according to the degree of use of GenAI:
 - a) **GenAI-S**, typical for the standards of the journal Science or those for the Elsevier reviewers cited at the beginning of this document, i.e. without the use of GenAI or at most with routine tools such as grammar checkers or auto-completion in word processing programs (e.g., Word),
 - b) **GenAI-auxiliary** where GenAI is used as an auxiliary pilot (copilot) for substantial text rephrasing or where part of the text is generated from scratch with GenAI. Annex 1 includes additional recommendations for GENAI-S and GenAI-auxiliary.

- c) **GenAI-1** where the text is essentially generated with GenAI.
7. For GenAI-S documents, the verification of the fulfillment of the requirements is almost impossible to do post-factum without error. Essays written ad-hoc in the exam room, possibly by hand, can ensure the inclusion in this category. Categories GenAI-auxiliary and GenAI-1 can be useful for specific scientific disciplines. Depending on the specifics of the field, we recommend the GenAI-S category for the completion of studies, but we also note that in certain areas it can be productive to use GenAI-auxiliary. We insist that the imposition of a certain standard must be adapted to the specificity of the field, the experience of the candidates/authors and the verification capacity of the examiners.
 8. Where possible, the examination regulations should explicitly include the requirement to identify and/or fall into one of the 3 categories described above (S, auxiliary, or 1) – and have realistic ways of verifying/implementing any limitations imposed on authors regarding the use of GenAI. Similar for other institutional contexts under the control of UBB – for example, the journals edited at UBB.
 1. Allowing GenAI access to a document generally involves transferring that document to external servers and access to the document of (1) the owners/creators of GenAI and (2) indirectly of potential future users of that GenAI. Therefore, it is necessary to avoid or prohibit the use of GenAI with confidential or sensitive documents (e.g., unpublished data and/or research, military security issues, etc.).

References

- (1) Buriak, J. M.; Hersam, M. C.; Kamat, P. V. Can ChatGPT and Other AI Bots Serve as Peer Reviewers? *ACS Energy Lett.* **2023**, 191–192. <https://doi.org/10.1021/acseenergylett.3c02586>.
- (2) Shaw, C.; Yuan, L.; Brennan, D.; Martin, S.; Janson, N.; Fox, K.; Bryant, G. GenAI in Higer Education: Fall 2023 Update Time for Class Study. 2023. tytonpartners.com/time-for-class-2023/GenAI-Update.
- (3) Conroy, G. How ChatGPT and Other AI Tools Could Disrupt Scientific Publishing. *Nature* **2023**, 622 (7982), 234–236. <https://doi.org/10.1038/d41586-023-03144-w>.
- (4) Van Noorden, R. ChatGPT-like AIs Are Coming to Major Science Search Engines. *Nature* **2023**, 620 (7973), 258. <https://doi.org/10.1038/D41586-023-02470-3>.
- (5) *Using Generative AI for Your Scientific Writing? Be Aware of Journal Policies : Civil and Environmental Engineering Communication Lab.* <https://mitcommmlab.mit.edu/cee/2023/08/27/using-generative-ai-for-your-scientific-writing-be-aware-of-journal-policies/> (accessed 2024-01-22).
- (6) *Science Journals: Editorial Policies | Science | AAAS.* <https://www.science.org/content/page/science-journals-editorial-policies#image-and-text-integrity> (accessed 2024-01-22).
- (7) *Publishing ethics | Elsevier policy.* <https://www.elsevier.com/about/policies-and-standards/publishing-ethics#0-publishing-ethics> (accessed 2024-01-22).

Appendix: Recommendations for responsible use as GenAI in GenAI-S works ¹

PRINCIPLES

1. Responsible use of GenAI: GenAI will only be used to improve works, but not to replace essential author tasks, such as scientific conceptual analysis
2. Promotion of originality: the copying of texts generated exclusively by GenAI will be avoided and especially without a prior structure input and verification of the generated material, ensuring the originality and authenticity of the works thus generated.
3. Personal responsibility: authors (e.g., students and supervisors in the case of bachelor's papers) will bear full responsibility for the content of their academic papers, ensuring that the use of GenAI is carried out with discernment and integrity.
4. Human control: Technology will be applied with human supervision and control, and all papers will be carefully reviewed and edited, as GenAI may generate results with formulations that suggest authority derived from knowledge, but may be incorrect, incomplete, or biased. Students are ultimately responsible and accountable for the content of their papers.

REQUIREMENTS

5. Citation: the use of GenAI will be declared in the paper. This requirement is in the same category as those related to the explanation of technologies and tools used in research, such as statistical analysis tools, interview coding or content analysis. All tools will be cited, and where relevant their use will be discussed in the methodology section. The authors have the responsibility to cite in their work the tools used and their owners/creators, either humans or corporations (such as: Bard, Claude, LLaMA, PaLM, Jasp, Nvivo, Atlas-TI, ChatGPT plugins, MyGPTs, ChatGPT Data Analytics).
6. Human authorial responsibility: GenAI will not be listed as authors or co-authors, nor will GenAI be cited as authors. The author's voice implies responsibilities and tasks that can only be assigned and performed by humans.
7. Prohibition of data fabrication: authors will avoid using GenAI for generating false data/content, except in cases where GenAI is the main subject of research. This is a broader requirement related to professional probity – not to invent data in research and the responsibility of authors to make their entire research process repeatable, i.e. scientific.
8. Compliance with ethics and deontology: authors will comply with the rules of ethics and professional deontology in the use of GenAI, including the protection of personal data. The requirement is broader, that of protecting subjects and personal data in research.

RECOMMENDATIONS

9. Information and understanding: Authors will seek to thoroughly inform themselves about how GenAI works and will understand their advantages and limitations before use.
10. Verification of information: authors will ensure the accuracy of the data and information in their works, using verifiable and credible sources. This is a broader principle, related to the use of other scientific sources in scientific argumentation.

¹ Appendix taken from the practices of the Faculty of Sociology and Social Work of UBB

11. GenAI complementarity: authors can use GenAI to gain understanding of concepts, or an overview, or/and to organize their ideas, but they will go through and use the literature, logical argumentation and critical thinking to substantiate the work.
12. GenAI as a tool for discovering scientific literature: authors can use AI to identify relevant sources and authors, but will consult and cite these sources appropriately in their work.
13. Reformulation: authors can use GenAI as a tool to improve the readability of the text formulated by them and the academic language used by them.
14. AI as a source of inspiration: authors can use the formulations and style of AI as a starting point for their own writing, but they will ensure that the final work is the result of their own knowledge and research. Taking over the text formulated in full by AI without clearly marking this is an academic fraud.