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Navigating the Impact of ChatGPT/GPT4 on Legal Academic Examinations: Challenges, Opportunities and Recommendations

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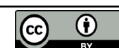
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Abstract

In this paper we explore the impact and implications of AI-driven language systems like ChatGPT/GPT-4 on academic paper writing in the context of universities and other higher educational institutions. We discuss the role of ChatGPT/GPT-4 in aiding students and researchers to streamline the writing process, overcome language barriers, and enhance productivity, while also analysing the potential risks of AI-generated content such as plagiarism, loss of critical thinking skills, and reduced creativity in academic writing. To address namely the issue of paraphrasing plagiarism facilitated by tools like ChatGPT/GPT-4, strengthening plagiarism detection methods might be a solution. However, it is crucial to promote awareness among students and researchers regarding the ethical implications of using AI in academic writing. In the future, the qualification of a text written with ChatGPT/GPT-4 will become more questionable as the border between plagiarism and automated creation is no longer clear. Additionally, we emphasize the importance of proper AI system usage and control, as well as the development of critical skills required to succeed in future professional settings. We propose various strategies for educational institutions to address these concerns and maximize the potential of AI tools, including promoting ethical AI usage, incorporating AI into the educational curriculum, and developing guidelines and regulations surrounding the use of AI in academic settings. By embracing and guiding the integration of AI technologies like ChatGPT/GPT-4 in academic paper writing, institutions can empower students and researchers to harness the full potential of these tools while maintaining academic integrity, fostering the development of critical skills, and supporting the international competitiveness of non-native English speakers in academic research.

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Introduction

Artificial intelligence (AI) has transformed numerous aspects of modern life, including the academic sphere. One of the latest AI innovations in natural language processing is the development of large language models, such as ChatGPT/GPT-4. As these AI models gain prominence and their usage has become widespread, it is essential to examine the potential implications, challenges, and opportunities they present to academic institutions, particularly concerning academic work, assessments, and examinations. In this study, we provide an overview of ChatGPT, discuss its impact on academia, and explore various strategies and practices to balance the benefits and concerns of integrating AI tools in the academic environment.

ChatGPT is an AI language model developed using OpenAI. It is based on the generative pretrained transformer architecture, which allows the model to generate human-like text based on input prompts. The training process of the model involves learning from vast amounts of text data, enabling it to understand the context and generate relevant responses.¹ ChatGPT has undergone multiple iterations, with version 3.5, showing significant improvement over earlier models in generating coherent, context-appropriate, and informative texts. The latest version, ChatGPT 4.0 (GPT4), further refines its capabilities and enhances its capacity to produce human-like results. This advanced AI tool has found applications across various domains including academic research, content generation, and text-based assistance. However, its remarkable capabilities also raise concerns about the potential misuse of AI-generated content and its implications for academic integrity.

Method Research

The purpose of this study is to explore the impact of ChatGPT/GPT4 on legal education, focusing on academic paper writing, including written examination tasks such as bachelor's and master's theses, and their potential implications for law students and future legal professionals. We developed a set of propositions based on our understanding of the subject and the existing knowledge. This method allowed us to generate a focused and thought-provoking discussion of the topic. The findings of this study are instructive for other scientific disciplines. The research design for this study is based on a structured, analytical approach to developing theses related to the impact of the ChatGPT on legal education and academic paper writing. This method involves identifying key issues and themes, formulating hypotheses or theses, and substantiating them using logical arguments. To develop the theses presented in this article, we drew on our background knowledge and experience in the fields of legal education and AI.

We employed GPT-4 as a supporting research tool to generate and refine content related to our topic. By inputting carefully crafted prompts, we were able to obtain

¹ Brady D Lund and Ting Wang, 'Chatting about ChatGPT: How May AI and GPT Impact Academia and Libraries?' (2023).

relevant information and insights from AI. We analyzed and critically evaluated the generated text and integrated it into our paper where appropriate. Our use of GPT-4 demonstrates the potential of AI systems in enhancing the research process while highlighting the importance of human intervention to ensure the accuracy and coherence of the information presented.

Advantages of ChatGPT for Students

Students will increasingly use AI tools to write examination papers, such as bachelor's or master's theses. ChatGPT offers a range of benefits for students, including assistance in writing individual chapters, suggesting Internet and database searches, proofreading, and improving the linguistic quality. The human-like results make it an appealing tool for students struggling with academic writing. Moreover, ChatGPT can accelerate the writing process and provide novel insights.

One of the most significant advantages of ChatGPT for students is its ability to support and enhance learning and research processes. With the wealth of information available on the Internet, ChatGPT can efficiently and effectively perform targeted searches and retrieve and summarize relevant resources, articles, and research papers. This can save students considerable time and effort in gathering information, allowing them to focus on understanding, analysis, and critical thinking.

ChatGPT can also assist students in generating and structuring their ideas by providing suggestions, structures or outlines for essays, research papers, and presentations. This can help students organize their thoughts more coherently and ensure that their work follows a logical flow. By offering a starting point or framework for their content, ChatGPT can stimulate creativity and guide students to develop more compelling and comprehensive academic work.

Another significant advantage of the ChatGPT for students is their ability to help students improve their language and writing skills. ChatGPT can serve as an advanced writing assistant by providing suggestions for phrasing, grammar, punctuation, and syntax. By using an AI tool to refine their language, students can enhance the overall quality and readability of their work, which can, in turn, contribute to better academic performance.

ChatGPT also facilitates collaboration and peer feedback by generating discussion points, posing questions, and offering potential counterarguments. By providing diverse perspectives, AI tools can encourage students to think more deeply about their work, engage in constructive discussions, and develop critical thinking skills. This collaborative environment can lead to higher-quality academic work and a more profound understanding of subject matter.

Finally, ChatGPT can provide personalized learning and support to students by tailoring their responses to specific needs, questions, or concerns. It can act as a virtual tutor, offering explanations, examples, and clarifications of complex topics or concepts. This customized assistance can help students overcome learning barriers and develop a better understanding of their coursework, leading to improved academic outcomes.

The ChatGPT offers numerous benefits to students in terms of enhancing their learning and research skills, providing content generation and structuring support, improving language and writing skills, encouraging collaboration and peer feedback, and providing personalized learning support. By harnessing the potential of this AI tool, students can not only improve the quality of their academic work but also develop essential skills for their future professional lives. However, it is important to balance these benefits with the use of AI and to maintain academic integrity in educational settings.

Limitations of ChatGPT

Despite its advanced capabilities, the ChatGPT sometimes provides inaccurate or incomplete information. The AI system is trained on vast datasets that may contain outdated or incorrect data. Consequently, the generated content may not always be reliable or, to date, pose a risk to students who depend on the AI tool for their research and academic work. Furthermore, ChatGPT may generate content that seems plausible but is completely fabricated. This is commonly referred to as “hallucination”.² The AI system does not have a built-in mechanism for fact-checking, which means it may

²Jochen Schiller in Dennis Yücel, ‘Künstliche Intelligenz Der Plappernde Papagei Im Netz’ (2023).

create content based on nonexistent or false sources.³ When we asked the system to find references and integrate them into our drafts, we received the most hallucinated references. Non-existing authors were invented, or conference papers from freely invented conferences were cited. Students relying on ChatGPT for their academic work must be cautious and must verify any information obtained from the AI system through independent research.⁴

While ChatGPT can generate human-like responses, its performance declines when faced with complex or specialized tasks. AI systems may struggle to understand nuanced concepts or specific terminology, leading to responses that are superficial or lack the required depth for high-quality academic work. This limitation means that students cannot entirely rely on ChatGPT for more intricate research or specialized subject matters.

The use of the ChatGPT raises ethical concerns related to plagiarism and academic integrity. Because the AI system generates content based on the input it receives, students may inadvertently or intentionally submit work that is not entirely their own. Furthermore, ChatGPT provides users with little information on the sources with which it was fed.⁵ This raises questions about the originality and authenticity of academic work as well as the ability of educational institutions to maintain academic standards and detect potential cases of plagiarism.

Overreliance on ChatGPT may lead to a weakening of students' critical thinking and problem-solving skills. If students become too dependent on AI-generated content, they may not develop essential skills, such as analyzing information, forming logical arguments, or synthesizing knowledge from different sources. This aspect is related to the following aspect (the trap of overreliance on ChatGPT for research): These skills are vital for academic success and future professional growth, and relying too heavily on AI tools, such as ChatGPT, could hinder their development.

³ David Smerdon, 'Why Does ChatGPT Make up Fake Academic Papers?' (*Twitter.Com*, 2023) <<https://twitter.com/dsmerdon/status/1618816703923912704>> accessed 30 April 2023.

⁴ Stephen Atlas, *ChatGPT for Higher Education and Professional Development: A Guide to Conversational AI* (Independently Published 2023) <https://digitalcommons.uri.edu/cba_facpubs>.

⁵ Ute Schmid in Oliver Pietschmann and Christoph Dernbach, 'ChatGPT: "System Kaum Kritisch Reflektiert"' (*Forschung und Lehr*, 2023).

A critical limitation of the ChatGPT is the potential for students to fall into the 'trap' of using it as a primary research instrument instead of engaging in more traditional research methods. This overreliance on ChatGPT can limit students' exposure to diverse sources that they would otherwise encounter by searching engines, databases, and libraries. Conducting thorough research is essential for developing a deep understanding of a topic and for forming well-informed arguments in academic work. By relying solely on ChatGPT, students may miss the opportunity to engage with a variety of perspectives, leading to a shallow understanding of their chosen subject.

Furthermore, to use ChatGPT effectively in paper writing, students need to have solid foundational knowledge of the topic. Without this understanding, they may struggle to evaluate the accuracy and relevance of AI-generated content. As ChatGPT can produce inaccurate or incomplete information, students with limited understanding of the subject matter may be unable to identify and rectify these errors, compromising the quality of their academic work. It is essential for students to recognize that ChatGPT should not replace traditional research methods but should be used as a supplementary tool. To ensure the proper use of ChatGPT in academic writing, students must develop a deep understanding of their chosen topic by engaging with diverse sources and conducting thorough research before utilizing AI-generated content to support their work. By doing so, students can maintain academic integrity while still benefiting from the advantages offered by the ChatGPT.

Limitations of ChatGPT in Legal Exams (Example of the German Legal Study System)

In the German legal study system, students mostly engage in case studies and hypotheses based on lengthy cases frequently drawn from real court decisions. Writing compilative essays on German tests and examinations is rare. These case studies demand a thorough understanding of the legal literature and the various arguments and discussions that take place within the court system. Furthermore, students must demonstrate their ability to make flexible and situational decisions, while offering detailed evaluations of different opinions to reach their own conclusions. This approach follows clear structures or schemes known as "Aufbauschema," which guides students' legal reasoning.

In addition, the exam paper in German legal education must mostly be written in the highly abstract, rigorous style of syllogism, the so-called “Gutachtenstil”. From the starting point of the legal question, the result is obtained in small steps. The solution begins with a clear hypothesis regarding the legal question to be answered. This is followed by a section on the prerequisites, relevant legal norms, and definitions. The third step is the subsumption of the facts under the definitions, followed by argumentation and results⁶ Despite its numerous benefits, ChatGPT remains limited in its ability to fully support students in this academic environment. The following are some reasons why the disruptive effect of ChatGPT might not be as strong within the German legal education system and its typical examination setup:

- Inability to replicate deep knowledge: While ChatGPT can provide general information and insights, it may struggle to replicate the in-depth understanding of the legal literature and court-based discussions that students are expected to have. This limitation may hinder students from engaging thoroughly in the nuances of specific legal problems.
- Limited understanding of “Aufbauschema”: While ChatGPT might be able to generate content that follows a general structure, its understanding of the specific “Aufbauschema” used in German legal education may be incomplete. Students need to be well-versed in these schemes to succeed in their legal studies, necessitating additional support and resources outside of AI systems, such as ChatGPT.
- Chatgpt is not yet able to apply the strict “Gutachtenstil’. As a language model, ChatGPT solves a set examination task primarily from the results in an argumentative and narrative manner. The ChatGPT could not pass a German exam.
- Lack of situational flexibility: Although ChatGPT can generate content that adheres to a logical structure, it may not always adapt to the flexible and situational decision making required in German legal case studies. Students need to develop this skill independently, as it is crucial for their success in both academic and professional settings.
- Difficulty in evaluating multiple opinions: The ChatGPT’s ability to assess and compare various legal opinions is not as developed as human reasoning. As a result, they might not be able to support students in forming their own well-informed and comprehensive viewpoints on complex legal matters.

Challenges for Academic Institutions:

As ChatGPT-generated content becomes more sophisticated, it is becoming increasingly difficult for lecturers and examiners to differentiate between human

⁶ Mathias Hütwohl, *Einführung in Das Recht* (1st edn, CHBeck 2020) 120.

and AI written work. This raises concerns about maintaining academic integrity and ensuring that students genuinely engage in the material. AI-generated text is still poorly recognized by currently available tools.

Another challenge is plagiarism, which involves the act of presenting someone else's work, ideas, or words as one's own without proper acknowledgement of the source. In academic and professional contexts, plagiarism is considered to be a serious ethical breach.⁷ This can lead to severe consequences, including loss of credibility, reputation, refusal of the paper, failure to pass the examination, and in some cases, legal repercussions.

The lack of transparency regarding the specific sources used by ChatGPT in generating text is an important concern, particularly in academic writing, where proper citation and attribution of sources are key aspects for maintaining integrity and avoiding plagiarism. ChatGPT is trained on a vast dataset containing text from numerous sources such as books, articles, and websites. During the training process, AI learns patterns, structures, and knowledge from these texts, which enables it to generate responses that are coherent and contextually relevant. However, it does not keep a record of the specific sources it has encountered, nor does it provide any references to these sources when generating text. This lack of transparency leads to inadvertent plagiarism. Owing to the absence of source information, there is a risk that the AI-generated content might inadvertently contain phrases, sentences, or ideas that are too similar to those found in the original sources. Although ChatGPT is designed to create original content, the possibility of inadvertent similarities cannot be entirely ruled out. Apart from plagiarism, academic writing requires the proper attribution of ideas, concepts, and theories to their original authors. The lack of transparency regarding ChatGPT sources makes it difficult or impossible to attribute specific ideas or concepts to particular authors, which may lead to issues of academic integrity.

⁷ Julianne East, 'Judging Plagiarism: A Problem of Morality and Convention' (2010) 59 Higher Education, 71-72.

Some students⁸ resort to professional writing studios to complete assignments for a fee.⁹ These studios have begun to use AI tools, such as ChatGPT, to enhance their services at a more favorable price, further complicating the detection of plagiarism and original work. The use of ChatGPT to reformulate existing student papers presents a significant challenge in the context of plagiarism. Paraphrasing plagiarism occurs when a writer rephrases someone else's work without proper citation and presents it as his own original content. ChatGPT's language generation capabilities enable it to reformulate existing text in a subtle and effective way that appears original, while preserving the underlying meaning and ideas. This can make it challenging for both automated plagiarism detection tools and human evaluators to discern whether a text is a paraphrased version of an existing source or genuinely original content. Plagiarism detection software primarily relies on identifying similarities in phrasing and structure between the submitted work and existing sources.¹⁰ However, ChatGPT's ability to generate diverse and natural sounding text might evade detection by producing content that does not exactly match the source material, even if the underlying ideas are not original. Using ChatGPT to reformulate existing papers without proper citations raises ethical concerns about academic integrity, as it undermines the values of originality, honesty, and intellectual contribution. Although the generated content might not be clearly identifiable as plagiarism, the act of repurposing others' work without acknowledgment remains ethically problematic. Fostering a culture of academic integrity, focusing on the development of original ideas, critical thinking, and in-depth analysis rather than merely paraphrasing existing work, is crucial. It is essential to promote awareness among students and researchers regarding the ethical implications of using AI in academic writing.

⁸ See regarding the issue of plagiarism in Indonesian academic education: Sutarimah Ampuni and others, 'Academic Dishonesty in Indonesian College Students: An Investigation from a Moral Psychology Perspective' (2020) 18 *Journal of Academic Ethics* 395 <<https://link.springer.com/article/10.1007/s10805-019-09352-2>> accessed 30 April 2023.

⁹ Lisa Lines, 'Ghostwriters Guaranteeing Grades? The Quality of Online Ghostwriting Services Available to Tertiary Students in Australia' (2016) 21 *Teaching in Higher Education* 889 <<https://doi.org/10.1080/13562517.2016.1198759>>.

¹⁰ Romans Lukashenko, Vita Graudina and Janis Grundspenkis, 'Computer-Based Plagiarism Detection Methods and Tools: An Overview', *Conference Proceedings CompSysTech '07 (2007) Art No 40:1-6*. Rousse, Bulgaria. <<https://doi.org/10.1145/1330598.1330642>> accessed 30 April 2023.

To address the issue of paraphrasing plagiarism facilitated by tools such as ChatGPT, strengthening plagiarism detection methods may be a solution. Plagiarism detection tools might soon or later be limited to the detection of paraphrasing plagiarism using ChatGPT. More importantly, however, the *qualification problem* regarding plagiarism is that the boundary between plagiarism and automated creation is becoming increasingly blurred. Consequently, not only the *identification of plagiarism* but also the *categorization* of a text written with ChatGPT as plagiarism will become increasingly uncertain. In our opinion, plagiarism will no longer play a significant role in the future of academic writing because of the rise in algorithmic writing.

Potential Responses from Academic Institutions

In terms of dealing with the disruptive challenges associated with the use of AI, several options are discussed.

One option may be to do nothing and observe it. This option involves universities waiting to see what other institutions do regarding the use of the ChatGPT in academic writing. However, this is not a good option, as universities have the primary responsibility to prepare students for the future of their profession. Ignoring the implications of AI in academic work would be a disservice to students who will inevitably encounter these technologies in their future careers. Thus, it is crucial for universities to proactively address the challenges and opportunities posed by AI tools, such as ChatGPT, rather than waiting for other institutions to take the lead.

Another rather radical possible response is to eliminate written assignments altogether, replacing them with alternative assessment methods such as oral presentations. However, this approach overlooks the importance of developing strong writing skills and universities' obligations to prepare students for their careers.

To maintain academic integrity, universities could require students to present and defend their written work orally, like the defense of a PhD thesis. This could help identify whether students truly understand the content they have submitted and would put pressure on them to prepare properly for the assignment.

Alternatively, academic institutions could embrace ChatGPT, allowing students to

use it in their assignments, provided that they are transparent about its usage. This would involve documenting the AI's use in the writing process, including the commands and prompts used, and the rationale behind students' choices. It might also involve a general statement in the acknowledgments or more specific citations within the text where exactly the AI-generated content was used. Recognizing that AI tools such as ChatGPT are likely to become increasingly prevalent in professional settings, some institutions may also opt to allow their use in academic work *without* any specific disclosure requirements. This approach emphasizes responsible use and the development of skills to work effectively with AI tools.

Universities can also explicitly ban the use of ChatGPT and similar AI tools for academic work, emphasizing the importance of independent writing and research. This approach involves adapting existing academic integrity policies to explicitly mention AI-generated content, implementing stricter monitoring procedures, and imposing penalties for violations. Academic institutions would need to invest in more comprehensive measures to detect AI-generated content, such as the use of plagiarism or AI detection software, scrutiny of sources, and direct interaction with students to assess their understanding of the material.

However, we see significant legal problems with this option: in examination law, universities must adhere to the rule of law, which means that students cannot be disqualified from an exam or academic work based on mere assumptions of having used a large language model, such as ChatGPT. Examiners may have hints that suggest the involvement of an AI system, such as an unusual writing style, characteristic mistakes resulting from AI hallucinations, or illogical statements. However, these hints alone are insufficient to conclusively prove the use of AI. Given the limitations of verifying AI-generated content, completely forbidding ChatGPT in take-home tasks is not a viable option for universities and schools. Instead, academic institutions should consider alternative approaches that address potential issues with AI-generated content without violating the rule of law in examination practice. This could involve promoting the responsible use of AI tools, refining assessment methods to focus on higher-order thinking skills, and providing guidelines to students on how to use AI ethically in their academic work.

ChatGPT and In-Class Exams

In situations where in-class exams aim to assess knowledge, academic institutions must continue to enforce strict rules regarding the use of smartphones, the ChatGPT, and other tools that could undermine the fairness of the examination process. If ChatGPT and Internet research were allowed during exams, institutions would need to adjust the focus of assessments to emphasize comprehension, transfer of knowledge, and problem-solving abilities. This approach would require a shift in the design of exam questions, privileging higher-order thinking skills over rote memorization.

Integrating ChatGPT into Classroom Learning

As AI tools such as ChatGPT are likely to become increasingly important in various professional settings, integrating them into classroom teaching will help students develop valuable skills to use these technologies responsibly and effectively. By introducing ChatGPT into classroom learning, lecturers can encourage creativity and foster students' critical thinking skills. Students learn how to improve ChatGPT results by checking the text and entering new prompts.¹¹ This involves using the AI tool as a supplementary resource rather than a replacement for independent research and analysis.

Conclusion

The development and integration of AI language models such as ChatGPT into various fields raises concerns and challenges for academic institutions to maintain academic integrity and ensure fair assessments. Balancing the potential benefits of AI tools while maintaining academic standards is crucial for students to develop essential skills in the ever-changing professional landscape.

Algorithmic writing should not become a threat to creative and critical thinking or to the aesthetics and individuality of student and researcher texts. While AI-generated content may streamline the writing process, it is important to maintain human touch and the unique perspectives individuals bring to their work. However, it is worth noting

¹¹ Ethan R Mollick and Lilach Mollick, 'New Modes of Learning Enabled by AI Chatbots: Three Methods and Assignments' (2022) SSRN Electronic Journal.

that scientific papers are primarily functional texts that prioritize clarity and precision over aesthetics. As such, the aesthetic aspect of scientific writing may not hold the same relevance as in literary works. AI-driven language systems can offer significant benefits to researchers and students who are not native English speakers, such as Indonesian users. By overcoming language barriers, these researchers can better compete on an international stage with researchers from English-speaking countries. With the assistance of AI language systems, researchers and students can focus more on developing ideas and knowledge rather than struggling with language issues. This allows them to dedicate their energy to the core elements of their work. Good papers still require skilled writers who can effectively guide and control AI language systems using their own specific knowledge. By providing the right prompts and refining the AI-generated content, only these writers will produce high-quality works. Teaching students these skills is essential in preparing them for their future professions, where the ability to navigate AI tools effectively is increasingly important.

As AI language models become more prevalent in academic writing and research, text writing is likely to lose much of its relevance. *We will see a shift from text design to intelligent and creative steering of AI systems by users and sophisticated control of generated texts.* This is the most important finding of the study, and it is in line with a *shift from the relevance of the written work to the relevance of the idea.*

This will have a significant impact on the current system of copyright protection, and the protectability of AI-generated text is currently uncertain, as contemporary copyright law focuses only on the work as an expression of an idea, and therefore, only on written results. The written products of the AI language systems may not be attributable to human authors.¹² Furthermore, if paraphrasing the use of existing texts by AI tools becomes commonplace, there will be a risk of a gap in the protection of creativity, as existing texts are exploited by algorithms. In terms of copyright law, there is a *need to discuss how ideas, for example in the form of prompts, can be legally protected beyond copyright protected works.*

¹² European Commission, 'Intellectual Property in ChatGPT' <https://intellectual-property-helpdesk.ec.europa.eu/news-events/news/intellectual-property-chatgpt-2023-02-20_en> accessed 30 April 2023.

Universities and other educational institutions must adapt to these changing dynamics, revise their examination methods, and ensure that students learn how to use AI tools effectively and responsibly. By doing so, they will not only maintain the integrity of academic work, but also equip students with the necessary skills to navigate the AI-powered future.

Addressing the challenges posed by artificial intelligence (AI) tools is crucial. This particularly relates to the aforementioned issue of (paraphrasing) plagiarism. Strengthening plagiarism detection methods may provide a temporary solution; however, ultimately, the focus should be on promoting awareness of the ethical implications of using AI in academic writing and fostering a culture of academic integrity. Emphasizing the development of original ideas, critical thinking, and in-depth analysis, rather than relying solely on algorithmically generated content, is crucial for maintaining the quality and rigor of academic work. We believe that in the future, the qualification of ChatGPT-generated text will become more questionable, as the line between plagiarism and automated creation will become blurred. Therefore, it is important to recognize that *plagiarism may not play a significant role in the future of academic writing but may be replaced by the issue of uncritical exploitation of ideas and existing work through algorithmic rewriting.*

Academic institutions must provide clear guidelines and rules regarding the use of AI tools such as ChatGPT for academic work. This includes defining what constitutes independent work, the appropriate use of AI-generated content, how such content should be cited and acknowledged, and subject-specific training regarding the use of these tools. We clearly favor the *rule-based integration of the use of AI tools into legal academic training, rather than a ban on such tools*, which is not in line with the mission of universities to prepare students for their future work, and which in any case has no chance of being effectively enforced by lecturers and universities.

It is important to note that the development of large language models has only just begun, and the limitations mentioned in this paper, such as the use of references and the hallucination problem, may be significantly improved as these technologies continue to advance and evolve. Furthermore, it is important to recognize that any studies on the use of ChatGPT or other AI systems in research and education are likely to be quickly

outdated owing to the rapid advances in AI technology. Nevertheless, the enduring principle that human creativity is the foundation of culture must not be overlooked. As we continue to integrate AI into lectures and work, we should remain mindful of the importance of fostering human creativity, critical thinking, and innovation.

Disclosure Statement

No potential conflict of interest was reported by the author.

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