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COPYRIGHT OF SCIENTIFIC WORKS BASED ON GENERATIVE AI: REGULATORY CHALLENGES OF ACADEMIC ETHICS

Gian Prima Natawijaya
Universitas Katolik Parahyangan
Email: 8052201015@student.unpar.ac.id[1], idanti@unpar.ac.id[2]

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Abstract

The use of Generative Artificial Intelligence (AI) in scientific writing creates new legal requirements, particularly regarding copyright protection, measures of originality, authorship, and academic integrity. Law No. 28 of 2014 concerning Copyright does not specifically regulate AI-based works, creating a normative gap when faced with the increasingly frequent use of AI-generated content in academic activities.This situation demands an update to the legal regulatory framework to address the dynamic development of AI technology in higher education. A hybrid regulatory approach, combining hard law and soft law, is the ideal framework for addressing these challenges. Hard law is needed as a basis for law enforcement and to ensure copyright protection for scientific works, while soft law plays a crucial role in shaping the behavior of academics through codes of ethics, institutional policies, and internal oversight and disciplinary mechanisms. The collaboration between these two instruments allows for a balance between legal certainty and academic ethical flexibility in regulating the use of AI. International legal practice demonstrates a global trend toward AI governance based on soft governance and self-regulation, without abandoning formal legal sanctions. While policies vary among the United States, the United Kingdom, and Japan, all countries agree in the principle that AI cannot replace humans as responsible creators (human authorship is mandatory). This concept provides an important foundation for Indonesia in formulating national policies that are not merely reactive, but anticipatory and in line with global regulatory developments. This research employs a normative legal research approach in the legal field, constructed on the basis of a study of legal principles, norms, dogmas, or rules, which are then analyzed comprehensively. However, the approach used in this research is normative-progressive, meaning it does not only examine legal dogma statically but also reinterprets existing positive legal norms critically and adaptively to the development of Generative AI technology, which has not yet been fully accommodated in the current Indonesian legal system.

Keywords:*Generative Artificial Intelligence, Copyright, Regulatory AI*

A. INTRODUCTION

In the era of rapid digital transformation, artificial intelligence (AI) technology has become a strategic component in various aspects of modern life. AI is no longer merely a computational system capable of mimicking human intelligence; it is now evolving into a generative entity with the capacity to autonomously produce new content. This phenomenon is a crucial starting point for shifting social and epistemic structures, including in the legal and higher education spheres. In particular, the integration of AI into the academic knowledge production process is beginning to reveal complex implications. AI has been used in academic tasks such as writing assistance, citation preparation, and literature synthesis, even to the stage of composing complete scientific manuscripts. This situation creates tension between fundamental academic values such as originality, scientific integrity, and author accountability and the sophistication of technology that can replace human intellectual roles. This is where a fundamental debate arises about who is truly the intellectual subject of a scientific work when artificial intelligence plays an active role in its creation. The development of AI has brought significant changes to various aspects of human life, from industry and healthcare to the economy and even education. Obianyo (2025) explains that:

"Artificial Intelligence has transcended its role as a mere tool to become an independent creator of literal, artistic, and inventive works. This evolution challenges traditional intellectual property laws, particularly in the domains of patents and copyright, where human authorship and inventorship have long been foundational principles."

"The requirement for human authorship raises significant issues regarding the eligibility of AI-generated works for protection."

"Can an AI system be legally recognized as an author or inventor? If not, who holds the rights to AI-generated works – the programmer, the user, or no one at all?".[1]

Free Translation:

"Artificial Intelligence has transcended its role as a mere tool to become an independent creator of literary, artistic, and innovative works. This evolution challenges traditional intellectual property law, particularly in the areas of patents and copyright, where the authenticity of human beings as creators and inventors has long been a fundamental principle."

"The requirement of human originality raises serious issues regarding the eligibility of the resulting work for protection."

"Can an AI system be legally recognized as the creator or inventor? If not, who holds the rights to the work produced by AI—the programmer, the user, or no one at all?"

In an academic context, Daniel J. Gervais, "The Machine as Author," Iowa Law Review, Vol. 105 No. 2 (2020) states:

"Machine learning, and specifically generative artificial intelligence (AI), allows for the creation of literary, musical, and artistic works, as well as scholarly writing, with minimal human intervention. This new ability to generate creative outputs autonomously raises fundamental questions about the definition of authorship and challenges the traditional requirement of human intellectual input. The boundaries between human and machine contributions are infinitely blurred."[2]

Free translation:

"Machine learning, and particularly generative artificial intelligence, is enabling the creation of literary, musical, artistic, and scientific works with minimal human intervention. This new ability to autonomously produce creative works raises fundamental questions about the definition of authorship and challenges traditional requirements for human intellectual contribution. The line between human and machine contributions is becoming increasingly blurred."

This confirms that AI is no longer merely a technical tool for data processing, but has undergone a functional transformation into a semi-autonomous entity capable of independently generating linguistic content, including compiling text, managing bibliographies, analyzing literature, and automatically composing paragraphs and entire scientific manuscripts. This evolution not only marks technological progress but also creates a paradigm shift in the teaching and learning process in higher education, as students and academics now directly encounter non-human intelligence systems. Consequently, there has been a change in the way scientific work is created, evaluated, and validated, which has traditionally been considered the result of human intellectual originality.

The influence of Generative AI has become very evident in the scientific writing process in academic environments, both at the undergraduate and postgraduate levels, thus demanding a redefinition of the concepts of originality, creativity, author contribution, and scientific authority itself. AI such as ChatGPT, Bing Copilot, Claude, as well as automated applications like Grammarly, Quillbot, and Mendeley AI have now become an integral part of modern academic writing practices. Their use is no longer limited to linguistic aids for correcting grammar or spelling, but has evolved into an intellectual partner that helps students construct logical arguments, develop scientific frameworks, synthesize literature, and present complex abstracts in structured writing. In practice, AI is also used to search for references, automatically paraphrase scientific manuscripts, and even suggest bibliographic citations, thus speeding up the process of composing academic papers. As stated by Koolen and Noto La Diega (2024):

"Generative AI (GenAI) is promising to revolutionize higher education. Whether it concerns legal scholars using ChatGPT to write their essays, computer science majors relying on GitHub Copilot to generate programming code, or art students turning to Midjourney to create visual artistry: the relevant AI tools to assist with educational

[1]CI Obianyo, Legal Challenges of Artificial Intelligence as a Creator in Patent and Copyright Law, Nnamdi Azikiwe University Journal of Private and Property Law, Vol. 2, no. 1 (2025): p. 1. accessed 17 August 2025https://journals.unizik.edu.ng/naujppl/article/download/5916/4913.

[2]Daniel J. Gervais, "The Machine as Author," Iowa Law Review, Vol. 105 No. 2, 2020, pp. 395-445. Accessed: August 17, 2025https://scholarship.law.vanderbilt.edu/faculty-publications/1164/

assignments are available online."[3]
Free Translation:

"Generative AI (GenAI) promises to revolutionize higher education. Whether it's legal experts using ChatGPT to write essays, computer science students relying on GitHub Copilot to generate programming code, or art students turning to Midjourney to create visual art, relevant AI tools to assist with educational tasks are now available online."

This phenomenon profoundly shakes the old foundations of knowledge as the result of individual human thought processes, because now academic knowledge is produced through active collaboration between humans and machines, which in certain contexts raises a critical question: to what extent do these products still reflect human intellectual autonomy and authenticity? This phenomenon significantly changes the concept of knowledge as the result of human thought processes to the result of collaboration between humans and machines.

However, the involvement of AI in the preparation of scientific papers not only creates technical transformations in academic writing practices but also raises serious conceptual challenges in the legal realm, particularly regarding the protection of Intellectual Property Rights (IPR). As Ayman Zain, Kareem, Kazar, & Ezzerouali (2025) point out:

"This study examines legislative gaps in copyright protection for AI-generated content, focusing on authorship, originality, and intellectual property rights. It evaluates current legal frameworks and proposes solutions to align them with sustainable development goals."

"AI enhances education and creative industries but raises ethical and legal concerns, especially in academic integrity and legal translation. Existing copyright laws lack clarity on AI-generated works, necessitating legal reform to balance innovation and intellectual property protection."[4]
Free Translation:

"This study analyzes legal gaps in copyright protection for content generated by artificial intelligence (AI), with a focus on copyright, originality, and intellectual property rights."

"Existing copyright laws are unclear regarding works generated by AI, necessitating legal reform to balance innovation and intellectual property protection."

This statement reflects the fact that Law Number 28 of 2014 still defines "creation" as the result of human work, so that the existence of AI as a collaborator or the involvement of AI systems in the process of creating scientific works collaboratively with humans causes a distortion of the concept of creators and owners of rights to the work. In this context, copyright law becomes a central point in assessing whether the work produced or assisted by AI can be qualified as a creation according to applicable laws. Article 1 number 3 of Law Number. 28 of 2014 explicitly defines creation as a work produced by "a person" or "several persons" who have intellectual abilities and conscious will, who with their thinking power, imagination, expertise, or skills create something original.[5]This provision implicitly removes AI as a legal subject because AI has neither free will nor moral consciousness.

The problem becomes even more complex when scientific works are created through a collaborative process between humans and AI systems, where the contributions of each party often cannot be clearly separated. The question of who owns the final results is whether it is the AI user, the AI system developer, or even neither party. This is a serious debate in modern intellectual property law. In such circumstances, national laws are challenged to reinterpret the concepts of creator and creative contribution to make them relevant to contemporary technological phenomena, or even adopt new approaches capable of filling the normative gaps increasingly evident in current developments.

However, in this context, as stated by Daniel J. Gervais, artificial intelligence does not have legal status as an author because it does not fulfill the element of "original intellectual conception" which is inherent in human subjects.[6]The involvement of AI in the creation of scientific works not only presents technical transformations but also conceptual challenges in the legal field. Copyright law, or Intellectual Property Rights (IPR), plays a key role in

[3]Christof Koolen & Guido Noto La Diega, "Copyright, Education, and Generative AI: Getting with the Programme?", Journal of World Intellectual Property, Vol. 27 (2024), pp. 1-1, Abstract. Accessed on August 17, 2025https://pureportal.strath.ac.uk/en/publications/copyright-education-and-generative-ai-getting-with-the-programme
[4]Ayman Zain, Abdulraheem Nasir Kareem, Okba Kazar, & Souad Ezzerouali, "The Legislative Gap for Copyright in the Era of Generative AI: Where do we Stand in Achieving Sustainable Development Goals?", SDGs Review Journal (2025), p. 1 (abstract objective and Result of discussion). Accessed August 17, 2025https://sdgsreview.org/LifestyleJournal/issue/view/148 Download:https://sdgsreview.org/LifestyleJournal/article/download/6057/2807
[5]See Article 1 number 3 of Law No. 28 of 2014 concerning Copyright, Article 1 number 3.
[6]Daniel J. Gervais. supra note 2. Pages 2053-2093

assessing whether AI-based work can be categorized as creation, and who can be claimed as the creator and owner of the rights to such work. The situation becomes even more complex when scientific works are created through collaboration between humans and AI systems, where the contributions of each party are difficult to clearly distinguish. A fundamental question arises: who owns the copyright to the final work? Is it the student using the AI, the AI system developer, or is there even no legitimate party due to the involvement of AI? Such circumstances present challenges in the legal interpretation of the concepts of "creator" and creative contribution to maintain their relevance to contemporary technological phenomena. National laws need to revisit these concepts or adopt new approaches to address the normative ambiguities that arise as a result of this reality. Without this, current copyright law (UUHC) will not fully address the legal challenges posed by the rapid advancement of generative technology.

In fact, the absence of explicit legal norms governing the role of AI in the creation of scientific works has created significant regulatory challenges in the Indonesian IPR protection system. This situation not only creates a lack of clarity in normative norms but also creates operational uncertainty, as it touches on the validity and legal recognition of works involving AI intervention. According to Daniel J. Gervais, the copyright legal system has traditionally relied on the assumption that creators are human beings with clear intentions and full control over the works they produce. This paradigm serves as a firmly established normative basis for copyright regulation in various countries, including Indonesia. However, the emergence of artificial intelligence, particularly generative AI, presents a serious challenge to this paradigm, as AI is capable of producing works independently without direct intervention or full control from humans. Thus, the conceptual foundation of creation in copyright law is disrupted and requires reinterpretation. Without a comprehensive, adaptive and integrated legal framework, Indonesia risks legal uncertainty in resolving copyright disputes related to AI-generated works, as well as opening up opportunities for the misuse of AI technology, which is generally difficult to control.

According to Daniel J. Gervais, emphasizes that the presence of AI demands a reconsideration both theoretically and normatively regarding the concept of creation:
"Copyright law has traditionally assumed a human author who has an intention to create and exercises control over the final form of the work. AI-generated works challenge these fundamental assumptions, thus reconsidering the need for both legal definitions and theoretical justification of authorship."[7]
Translation:

"Copyright law traditionally assumes that the creator is a human being with the intention to create and the exercise of control over the final form of their work. Works produced by artificial intelligence (AI) challenge these fundamental assumptions, necessitating a reexamination of both the legal definition and the theoretical justification for the concept of creation itself."

The practical implications of this situation are beginning to emerge. For example, when a student writes a paper using extensive AI assistance, a legal question arises: can the student still be considered a legitimate creator, or is he merely acting as a technology operator without any meaningful intellectual contribution? Similarly, can the educational institution, as the provider of the environment and facilities, claim ownership of the work? In an extreme scenario, could it be argued that such work has no legitimate owner at all, as AI is not a legal entity and its human contribution is difficult to concretely verify? CI Obianyo stated that:

"The absence of a clear legal framework to determine the role and boundaries of AI as a creator poses a significant regulatory gap. This legal vacuum may result in jurisdictional uncertainty and complicate the enforcement of copyright and patent rights in AI-generated works."[8]
Free Translation:

"The absence of a clear legal framework defining the role and boundaries of artificial intelligence (AI) as a creator creates a significant regulatory gap. This legal vacuum can lead to jurisdictional uncertainty and complicate the enforcement of copyright and patent rights over AI-generated works."

The absence of a clear legal definition of the role and limitations of AI in the creation of works can create a legal vacuum, which in turn creates the potential for legal disorientation in the national intellectual property protection system. This issue demonstrates that the current legal system is not ready to accommodate modern, semi-automated forms of creation. Without a clear legal framework, Indonesia faces legal uncertainty in AI-based copyright disputes, while also creating opportunities for difficult-to-control violations.

Furthermore, the use of artificial intelligence (AI) in the preparation of scientific papers also presents serious challenges to academic integrity, the moral and ethical foundation that underpins all Higher Education practices.

[7]Daniel J. Gervais, supra note 2. p. 2047–2049.
[8]CI Obianyo, supra note 2. p. 2,

Scientific papers are conventionally understood as the result of critical thinking and in-depth analysis conducted by individuals with academic competence, ethical responsibility, and full awareness of their original contributions. However, when text, arguments, or even the entire structure of a scientific paper can be generated by AI with just a brief command from the user, the line between intellectual originality and automatic replication becomes increasingly blurred. In this context, a new risk arises in the form of unconventional plagiarism, namely AI-generated plagiarism, where someone dishonestly claims the output of a machine as their own. This opens the door to pseudo-collaboration between humans and technology, where human involvement is merely symbolic without contributing anything substantive to the content of the writing. In fact, in some cases, AI users can manipulate academic content to conform to graduation requirements or scientific publications, without any legitimate intellectual process. If this phenomenon is not properly regulated and monitored, it will lead to a decline or deterioration in academic morality, which will call into question the credibility of degrees, the reputation of institutions, and the scientific quality of work. Therefore, it is crucial to establish an ethical and normative framework that clearly distinguishes between assistive AI and AI that completely replaces human intellectual functions. As Kim (2024) points out:

"The use of ChatGPT in academia may result in academic misconduct if outputs are presented without proper verification or disclosure, leading to an erosion of trust in scholarly publishing."[9]

Free Translation:

"The use of ChatGPT in academic settings could lead to ethical violations if the results are presented without adequate verification or clear disclosure, which could lead to a loss of trust in scientific publications."

Therefore, this reinforces the urgency of developing an ethical framework that can separate the use of AI as an assistive tool and the use of AI that substantively replaces human intellectual processes.

From an academic ethics perspective, the use of artificial intelligence (AI) in scientific writing without explicit disclosure or declaration can be categorized as a new form of systemic academic misconduct, namely AI-generated plagiarism. This phenomenon blurs the line between human intellectual contributions and technological output, and poses a risk of misuse that can directly impact the credibility of higher education institutions. As explained by SangJun Kim, violations in this context include not only literal plagiarism but also the disguise of the intellectual origin of machine-generated content. In fact, as noted by Liebrenz et al.:

"The functionality of ChatGPT has the capacity to cause harm by producing misleading or inaccurate content, thereby eliciting concerns about misrepresentation and integrity in authorship."[10]

Free translation:

"ChatGPT's capabilities could have negative impacts through the production of misleading or inaccurate content, raising concerns regarding forgery and authorship integrity."

When students extensively use AI to write their undergraduate theses, dissertations, or scientific articles, but fail to disclose the AI's role, they constitute a false scientific claim. If left unchecked, this practice can lead to errors in scientific judgment by supervisors and examiners, and undermine public trust in the institution's academic quality standards. Therefore, a number of leading universities worldwide, such as Oxford, Cambridge, MIT, and Harvard, have implemented internal policies requiring declarations of AI use and establishing technology-based ethical violation detection mechanisms. In Indonesia, although general guidelines from the Directorate of Learning and Student Affairs (Belmawa), part of the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek), have been issued since 2023, their implementation still faces significant challenges. Without a clear ethical framework and oversight, the Indonesian academic system risks fostering a pseudo-academic culture that undermines the validity of degrees and public trust in higher education institutions. This form of violation involves not only the appropriation of ideas or words without attribution as in the conventional definition of plagiarism, but also the act of disguising the intellectual origin of a work that is actually produced by a non-human entity. As noted by Liebrenz et al. (2023):

"Nonetheless, the functionality of ChatGPT has the capacity to cause harm by producing misleading or inaccurate content, thereby eliciting concerns about misrepresentation and integrity in authorship."[11]

[9]SangJun Kim, Research Ethics and Issues Regarding the Use of ChatGPT-like Artificial Intelligence Platforms by Authors and Reviewers: A Narrative Review, Science Editing, Vol. 11(2), 2024,, p. 98. Accessed August 17, 2025https://escienceediting.org/upload/pdf/kcse-343.pdf

[10]Liebrenz M, R. Schleifer, A. Buadze, D. Bhugra, A. Smith, Generative AI and ChatGPT in Scientific Writing: Ethical Challenges and Opportunities, The Lancet Digital Health, Vol. 5(2), 2023, p. E93–E95. Accessed August 17, 2025*https://doi.org/10.1016/S2589-7500(23)00019-5*

[11]*Ibid,page e105*

Free translation:

"Nevertheless, ChatGPT functionality has the potential to cause adverse impacts through the production of misleading or inaccurate content, raising concerns about inaccurate representation and integrity in authorship."

Therefore, disclosing the role of AI is crucial for maintaining academic integrity. In this context, when students write their undergraduate theses, dissertations, or scientific papers with extensive AI assistance but without disclosing AI's involvement in the creative process, they create false scientific claims that can mislead readers, supervisors, and even degree-granting institutions. This situation directly threatens the credibility of higher education institutions as pillars of intellectual society, because without adequate detection and oversight mechanisms, academic degrees can be obtained without a legitimate intellectual process. Therefore, a number of leading universities worldwide have established internal ethics policies that require declarations of AI use and have designed technology-based monitoring systems to detect potential violations. In Indonesia, despite having guidelines from the ministry, it still faces significant challenges in upholding academic ethics in this AI era. Without firm and ongoing policy updates, the risk of a pseudo-academic culture will increase, undermine the integrity of scientific degrees, and ultimately undermine public trust in the higher education system as a whole. It can be said that this phenomenon will seriously threaten the credibility of educational institutions and the validity of academic degrees, especially in the absence of a firm and clear oversight system or ethics policy.

To address the ethical and academic legitimacy issues arising from the increasing use of artificial intelligence (AI) in academic writing, a number of leading universities worldwide have taken progressive steps to establish adaptive internal regulatory systems related to AI in academic writing. This is achieved through the Russell Group, an alliance of 24 leading research universities in the United Kingdom known for their academic excellence and influence on higher education and research policy. Founded in 1994, the group includes prestigious institutions such as the University of Oxford, the University of Cambridge, Imperial College London, and the University of Edinburgh. The Russell Group frequently shapes the direction of academic policy in the UK, including on issues of research and academic integrity.

In the context of the use of artificial intelligence (AI) in scientific writing, the Russell Group has formulated progressive ethical principles in response to the challenges presented by generative technologies such as ChatGPT. These principles state that:

"Whenever AI is used, similar safeguards to those relating to plagiarism should be adopted. Authors should never pass off ideas or text gleaned from AI as their own, and there should be a clear acknowledgment to how AI has been used in the work." "Authors should never pass off ideas or text gleaned from AI as their own, and there should be a clear acknowledgment of how AI has been used in the work" (2024)[12]

Free translation:

"Whenever AI is used, protective measures similar to those for plagiarism should be applied. Authors should not claim ideas or text derived from AI as their own, and there should be clear acknowledgement of how AI has been used in the work."

This statement emphasizes the importance of transparency, accountability, and ethical declarations in the use of AI. The Russell Group Principles encourage AI not to be misused to create the false impression of authorship or dishonestly conceal technological contributions. In the Indonesian context, these principles can serve as a reference for international best practices in formulating ethical policies or academic codes of conduct governing the use of AI in scientific work. This signifies that authors should not present ideas or text derived from artificial intelligence (AI) as their own work, and there should be clear acknowledgement of how AI is used in the work and therefore the use of AI must be disclosed transparently. In line with this principle, Harvard University also emphasizes the importance of ethical use of AI by stating:

"The University supports responsible experimentation with generative AI in research and teaching, provided that its use is disclosed and does not compromise academic integrity."[13]

Free translation:

"The University supports responsible experimentation with generative AI in research and teaching, as long as its use is clearly disclosed and does not compromise academic integrity."

[12]*Academic Support (University of Oxford), "AI in Teaching and Assessment" (2024), Oxford. Accessed August 17, 2025https://academic.admin.ox.ac.uk/ai-in-teaching-and-assessment?utm_source*

[13]Harvard University, Guidelines for the Responsible Use of Generative AI, Harvard University Information Technology (HUIT), 2024, General Principles. Accessed August 17, 2025https://www.huit.harvard.edu/ai/guidelines#:~:text=The%20University%20supports%20responsible%20experimentation

This means that authors should not present ideas or text derived from artificial intelligence (AI) as their own work, and there should be clear acknowledgement of how AI is used in the work, and therefore the use of AI must be transparently disclosed. Another example is the National University of Singapore (NUS),AI is seen as a potential learning tool. However, its use can only be justified if it is conducted transparently and responsibly. Failure to disclose the use of artificial intelligence (AI) in the preparation of scientific papers is seen as a serious violation of academic ethics. In certain contexts, this action can even be categorized as a new form of plagiarism. Academic guidelines from the National University of Singapore (NUS) state that:

"A student is found to have submitted work generated by AI but fails to acknowledge their use of AI can still be sanctioned for plagiarism… the student has committed academic dishonesty in misrepresenting the nature and source of their work"[14] (point 2.6 academic Dishonesty and AI detector Verdicts: NUS CTLT, 2024).

Free translation:

"A student who is proven to have submitted work produced by artificial intelligence (AI) but does not acknowledge the use of AI can still be subject to sanctions for plagiarism…the student has committed academic fraud by concealing the nature and source of their work" (NUS CTLT, 2024)

In line with this, institutions such as Oxford, Harvard, and NUS have established explicit policies requiring that any use of AI in scientific work be accompanied by honest and detailed disclosure. Furthermore, several universities have also developed comprehensive digital ethics guidelines and implemented AI-based automated detection systems to verify the authenticity and originality of scientific work. As stated by Liebrenz et al. (2023):

"The functionality of ChatGPT has the capacity to cause harm by producing misleading or inaccurate content, thereby eliciting concerns about misrepresentation and integrity in authorship."[15]

Free Translation:

"The ChatGPT function has the potential to cause harm by generating misleading or inaccurate content, raising concerns about misrepresentation and integrity in the writing."

This suggests that while AI brings efficiency, its unsupervised use has the potential to create serious challenges to academic integrity, including originality, accuracy, and intellectual honesty. Therefore, this policy does not aim to completely ban the use of AI, but rather to ensure transparency, academic honesty, and the protection of original values. These measures reflect global awareness of the importance of balancing technological advancement with integrity in higher education. Unfortunately, in Indonesia, similar policies remain fragmented and lack national coordination. Although the Directorate of Student Affairs and Student Affairs at the Ministry of Education has issued initial guidelines, their implementation relies heavily on the initiative of individual universities. As a result, there is no consistent and nationally binding standard of academic ethics for addressing the generative challenges of AI.

As an initial step in responding to the massive use of artificial intelligence (AI) technology in academic environments, the Directorate of Learning and Student Affairs (Belmawa), Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia, published a Guidebook for the Use of Generative AI in Higher Education in 2024. This document was presented as a form of anticipation of potential deviations in the use of AI by students and lecturers, as well as an ethical guideline for the use of AI in the learning process and scientific writing. In the guide, it is emphasized that AI can be used as a tool to support the learning process, such as in terms of compiling references, spell checking, or formulating initial ideas. However, "AI is not permitted to take over the main role in scientific creation, such as compiling critical arguments, concluding research results, or conveying original reflections" (Kemendikbudristek RI, 2024, p. 15)[16]While this guideline represents a progressive step toward adapting education policies that are more responsive to technological developments, it remains a soft regulation—not legally binding, leaving its implementation highly dependent on the internal policies of each university. Consequently, ethical standards and oversight mechanisms for the use of artificial intelligence (AI) in higher education in Indonesia remain heterogeneous and do not guarantee national certainty. This quote reflects the potential for the absence of explicit regulations regarding artificial intelligence (AI) in copyright law to create a normative vacuum and uncertainty in practice, both at the academic and institutional levels. This situation emphasizes the need for a more comprehensive

[14]National University of Singapore, AI Guidelines for Students, Policy for Use of AI in Teaching and learning, 2024. Accessed 17 August 2025 https://ctlt.nus.edu.sg/wp-content/uploads/2024/08/Policy-for-Use-of-AI-in-Teaching-and-Learning.pdf

[15]Liebrenz, M. supra note 10 , p e105.

[16]Directorate of Learning and Student Affairs, Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia, Guidebook for the Use of Generative AI in Higher Education (2024), Chapter 2.3 "Ethics of Using Generative AI in Scientific Work", p. 15, accessed on August 17, 2025https://lldikti3.kemdikbud.go.id/wp-content/uploads/2024/11/Buku-Panduan-_-Penggunaan-Generatif-AI-pada-Pembelajaran-di-Perguruan-Tinggi-cetak.pdf

and systematic legal study, with an approach that is not merely dogmatic-normative, but also responsive to the dynamics of rapidly developing and disruptive technology. The absence of clear legal norms regarding the involvement of artificial intelligence (AI) in the preparation of scientific works has raised fundamental questions that have not yet received adequate answers within the national legal system – including the legal status of works produced with the assistance of AI, the position of users as creators, and the position of educational institutions regarding technology-based intellectual products. Without clear and directed regulations, Indonesia risks experiencing legal and policy disorientation, where educational institutions, lecturers, and students lack reliable normative references to guide the ethical and responsible use of technology. Furthermore, this lack of legal certainty risks creating an imbalance between AI users who act ethically and those who misuse it for personal gain, which could ultimately tarnish academic integrity as a whole. Therefore, according to the author, this study is very important not only to formulate the right law in copyright protection for AI-based scientific works, but also as a form of contribution to the development of a national legal system that is able to maintain the dignity and noble values of Higher Education as an arena for developing original, critical, and innovative thinking that continues to uphold the principle of scientific honesty.

Not only is national law a priority, but global developments related to copyright regulations for artificial intelligence (AI)-based works are also worthy of reference for comparison and reflection in building an adaptive Indonesian legal framework. As Sang-Jun Kim notes in his review narrative:

"Given that non-academic AI platforms like ChatGPT often do not disclose their training data sources, there is a substantial risk of unattributed content and plagiarism. Therefore, researchers must verify the accuracy and authenticity of AI-generated content before incorporating it into their article, ensuring adherence to principles of research integrity and ethics, including avoidance of fabrication falsification, and plagiarism."[17]

Translation:

"Given that non-academic AI platforms like ChatGPT often do not disclose the sources of their training data, there is a significant risk of unrecorded content and plagiarism. Therefore, researchers should verify the accuracy and authenticity of AI-generated content before including it in their articles, ensuring adherence to principles of research integrity and ethics, including avoiding fabrication, data manipulation, and plagiarism."

In the United States, the U.S. Copyright Office has taken a firm position that only works containing substantial human contributions can be protected by copyright. In practice, copyright applications for works generated entirely by AI have been repeatedly rejected on the grounds that they do not meet the requirements for original human authorship.

As noted by Sang-Jun Kim (2024):

“Even though there were no grammatical errors or plagiarism in the ChatGPT-generated text, the overall originality was evaluated lower.”[18]

Free translation:

“Although there were no grammatical errors or plagiarism in the text generated by ChatGPT, the overall level of originality was rated lower.”

This statement asserts that human originality is a key element in the US copyright legal system, and is the primary basis for rejecting content generated entirely by artificial intelligence. Meanwhile, in the UK, a different, progressive approach is emerging. This country recognizes the possibility of limited protection for AI-based works as "technological output," provided that copyright is granted to the individual who organizes or directs the AI's creative process, not to the AI itself. This approach attempts to bridge the need for legal protection without undermining the normative principle that only humans can be copyright subjects. In contrast, Japan takes a much more restrictive position. The country states that AI-generated works do not meet the criteria for copyright protection due to the absence of a human creator, and therefore automatically fall into the public domain. Therefore, such works can be used, modified, and distributed by anyone without permission or attribution.

These three approaches—conservative (United States), experimental (United Kingdom), and liberal (Japan)—represent different paradigms in responding to copyright challenges in the digital age. For Indonesia, understanding this diversity of global practices is crucial so that domestic policies do not develop in silos but are able to accommodate the complexities of cross-border technologies like AI.

Emphasizing this variety of approaches, Kim (2024) notes:

[17]SangJun Kim, supra note 9, p 99
[18]Ibid, p. 20

"In Japan, AI-generated content is not subject to copyright because it lacks a human creator. The UK, by contrast, accepts the possibility of copyright over computer-generated works, with rights assigned to the person who makes the necessary arrangements for the creation."[19]

Translation:

"In Japan, content generated by artificial intelligence (AI) is not protected by copyright because it lacks a human creator. On the other hand, the UK recognizes the possibility of copyright in computer-generated works, with the right vested in the person who made the necessary arrangements for the creation of the work."

From an academic perspective, the freedom to use AI in the process of writing scientific papers needs to be understood critically and proportionally so as not to erode the fundamental values of the long-established scientific tradition. The authenticity of human thought and intellectual contribution is an irreplaceable foundation in academic research, because the scientific process is truly a reflection of reasoning power, critical thinking skills, and the accumulation of knowledge derived from experience, observation, and rational analysis. In this case, the involvement of AI is not to replace human thinking capacity, but rather merely as a tool that supports the effectiveness of writing or processing information. Therefore, it is important to emphasize that the use of artificial intelligence (AI) in its entirety in the preparation of scientific substance, including in formulating conclusions and developing main arguments, has the potential to undermine scientific authenticity and cause epistemological disorientation in the academic environment. Therefore, it is necessary to emphasize that the full use of AI in compiling scientific substance, formulating conclusions, or even developing main arguments, is very risky in undermining scientific authenticity and causing epistemological disorientation in the academic environment. In line with this, Liebrenz et al. (2023) emphasized that:

“If ChatGPT or similar tools are used without transparent disclosure, authorship misrepresentation might occur, jeopardizing the integrity of scientific publications.”[20]

Translation:

“If ChatGPT or similar tools are used without transparent disclosure, misuse of author attribution may occur, which could threaten the integrity of scientific publications.”

Therefore, regulations that limit the wise use of AI are essential, not a blanket ban, but rather a transparent approach that recognizes human contributions as holders of academic legitimacy. This policy must be accompanied by robust oversight mechanisms, honest reporting, and ethical education that instills the understanding that technology should only be used to the extent that it does not eliminate human thought processes.

In the context of copyright law, the emergence of artificial intelligence (AI) as a non-human entity raises fundamental questions about its status as a mere tool or as a creator. Traditional concepts of copyright presuppose human creative intent, control over the creative process, and a direct causal relationship between the creator and the resulting creation. When AI is used to generate scientific content, the user's position becomes ambiguous: can they be considered a creator simply by prompting and operating the AI system, or must there be evidence of active and substantive intellectual contribution to the creative process? This question demands normative clarification, because without clear legal boundaries regarding the degree of human contribution in the use of AI, there is a risk of the widespread practice of producing scientific works without meaningful human creative involvement.

This situation raises a larger issue: is national copyright law, particularly Law No. 28 of 2014, still capable of responding to technological challenges that are moving much faster than the capabilities of lawmakers? If not, then strategic steps are needed, such as formulating a new legal framework or conceptual reinterpretation of terms such as creator, original work, and creative contribution.

As emphasized by Daniel J. Gervais (2020), that:

"Copyright law is based on the fundamental premise that protection vests in human authors. Machine output, by contrast, lacks human creativity, intention, and moral accountability, raising profound doctrinal questions."[21]

Free translation:

"Copyright law is based on the fundamental principle that copyright protection rests with human creators. Machine-made creations, on the other hand, lack human creativity, intent, and moral responsibility, thus raising fundamental questions in legal doctrine.

Therefore, adaptation efforts are needed to ensure the legal system remains relevant in the digital era based

[19]Ibid, p. 20
[20]Liebrenz M. supra note 10. p e105
[21]Ibid., p. 2057.

on artificial intelligence (AI). This step is crucial not only to ensure legal certainty but also to maintain the integrity of the intellectual property legal system amidst an increasingly complex innovation landscape. This research aims to contribute concrete insights to address the regulatory challenges posed by the use of artificial intelligence (AI) in the creation of scientific papers. By examining the legal status of copyright for scientific papers produced through the aid of AI technology and mapping its intersection with academic ethics and institutional policies within higher education institutions, this research aims to develop an analytical framework that is both normative and implementable. As stated by SangJun Kim, he states that:

"Human authors must assume full responsibility for ensuring the originality transparency, integrity, and validity of their AI-supported manuscripts."

"The use of ChatGPT-like AI platforms poses potential risks to the integrity of research, sparking concerns about the accuracy and originality of published articles."[22]

Free translation:

"Human authors must be fully responsible for the authenticity, transparency, integrity, and validity of manuscripts powered by artificial intelligence (AI)."

"The use of artificial intelligence (AI) platforms such as ChatGPT has the potential to threaten the integrity of research, raising concerns about the accuracy and authenticity of published articles."

Thus, even though AI-generated texts can escape plagiarism detection, their originality is still considered low, thus raising serious academic integrity issues in modern scientific writing practices.

This context emphasizes that the use of ChatGPT can lead to the presentation of misleading content and risk compromising the validity of authorship if not accompanied by an honest declaration. The resulting recommendations are expected to provide a basis for the formation of public policies that are more adaptive to today's digital reality, without sacrificing the values of academic integrity that have long been the foundation of scientific knowledge. Furthermore, this research is expected to broaden the scientific discourse on copyright protection in the era of generative technology and serve as an important reference in interdisciplinary discussions between law, technology, and higher education.

In line with the growing urgency of academic ethics in the digital era, global awareness is growing regarding the importance of artificial intelligence (AI) governance that emphasizes not only technical aspects but also moral principles, scientific responsibility, and respect for human rights. One international reference instrument in this regard is Regulation (EU) 2024/1689 on Artificial Intelligence (AI Act) issued by the European Union. This regulation is designed with a risk-based approach and places an ethical foundation as a primary prerequisite for the development of trustworthy AI. Article 95 states,[23]mentions:

Article 95

Codes of conduct for voluntary application of specific requirements

1. The AI Office and the Member States shall encourage and facilitate the drawing up of codes of conduct, including related governance mechanisms, intended to foster the voluntary application to AI systems, other than high-risk AI systems, of some or all of the requirements set out in Chapter III, Section 2 taking into account the available technical solutions and industry best practices allowing for the application of such requirements.
2. The AI Office and the Member States shall facilitate the drawing up of codes of conduct concerning the voluntary application, including by deployers, of specific requirements to all AI systems, on the basis of clear objectives and key performance indicators to measure the achievement of those objectives, including elements such as, but not limited to:
    a) Applicable elements provided for in Union ethical guidelines for trustworthy AI;
    b) Assessing and minimizing the impact of AI systems on environmental sustainability, including as regards energy-efficient programming and techniques for the efficient design, training and use of AI;
    c) Promoting AI literacy, in particular that of persons dealing with the development, operation and use of AI;

[22]SangJun Kim, supra note 9. pp. 104, 106.

[23]European Union, Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 March 2024 laying down harmonized rules on Artificial Intelligence (AI Act), Official Journal of the European Union, L 134, 13 May 2024, Article 95,https://eur-lex.europa.eu/eli/reg/2024/1689/oj, accessed August 17, 2025.

d) Facilitating an inclusive and diverse design of AI systems, including through the establishment of inclusive and diverse development teams and the promotion of stakeholders' participation that process;
e) Assessing and preventing the negative impact of AI systems on vulnerable people of groups of vulnerable people, including as regards accessibility for people with a disability, as well as on gender equality

3. Codes of conduct may be drawn up by individual providers or deployers of AI systems or by organizations representing them or by both, including with the involvement of any interested stakeholders and their representative organizations, including civil society organizations and academia. Codes of conduct may cover one or more AI systems taking into account the similarity of the intended purpose of the relevant systems.
4. The AI Office and the Member States shall take into account the specific interests and needs of SMEs, including start-ups, when encouraging and facilitating the drawing up of codes of conduct.

Free translation:
Article 95
Code of ethics for voluntary application of certain prerequisites

1. The AI Office and Member States should encourage and facilitate the development of codes of conduct, including associated governance mechanisms, aimed at encouraging the voluntary implementation by AI systems—other than high-risk AI systems—of some or all of the requirements set out in Chapter III Section 2, taking into account available technical solutions and industry best practices that enable the implementation of such requirements.
2. The AI Office and Member States should facilitate the development of a code of conduct on the voluntary application, including by deployers, of certain requirements to all AI systems, based on clear objectives and key performance indicators to measure the achievement of these objectives, including elements such as but not limited to:
    1. relevant elements as contained in the European Union's ethical guidelines on trustworthy AI;
    2. assessing and mitigating the impacts of AI systems on environmental sustainability, including those related to energy-friendly programming and efficient AI design, training, and deployment techniques;
    3. increasing AI literacy, especially for those involved in the development, operation, and use of AI;
    4. facilitating the design of inclusive and diverse AI systems, including through the formation of inclusive and diverse development teams and promoting stakeholder participation in the process;
    5. assessment and prevention of negative impacts of AI systems on vulnerable parties or vulnerable groups, including those related to accessibility for people with disabilities, as well as gender equality.
3. Codes of conduct can be developed by individual providers or deployers of AI systems, or by their representative organizations, or both, including by involving relevant stakeholders and their representative organizations, including civil society organizations and academics. Codes of conduct can cover one or more AI systems, taking into account the shared purposes for which the systems are used.
4. The AI Office and Member States should take into account the special interests and needs of Micro, Small, and Medium Enterprises (MSMEs), including start-ups, when encouraging and facilitating the development of codes of conduct.

Article 95 emphasizes that the AI Office and Member States are encouraged to facilitate the development of codes of conduct to encourage the voluntary implementation of some or all of the ethical requirements for AI systems that are not classified as high-risk. These ethical principles include: guidelines for trustworthy AI, environmental sustainability, increasing AI literacy, inclusive design, and protecting vulnerable groups, including people with disabilities or gender equality issues. The development of codes of conduct can be carried out individually by providers or deployers of AI systems, or through representative organizations involving stakeholders such as civil society and academics. This provision also explicitly requires the government to consider the interests of the MSME and start-up sectors in formulating such ethical governance. The AI Act thus positions voluntary codes of conduct as a participatory, flexible, and adaptive internal ethical control mechanism. This model is seen as strategic for building public trust, preventing misuse of technology, and providing an ethical framework responsive to the rapid development of AI in various contexts, including academic knowledge production. In the context of this research, these provisions demonstrate how an ethics-based soft law approach can serve as a bridge to the development of more comprehensive national hard law in the future. In contrast, Indonesia currently lacks a national academic code of conduct that specifically regulates the use of AI in scientific writing or the protection of academic integrity. Existing

regulations are still sectoral and general, primarily through the Ministry of Communication and Information Technology (Kemenkominfo) and the Ministry of Education, Culture, Research, and Technology (Kemendikbud-Ristek), potentially creating a normative gap in responding to academic ethics violations such as AI-generated plagiarism, AI-based writing manipulation, and claims of academic authorship without human creative contribution. Therefore, establishing anticipatory and adaptive national ethical standards is urgently needed to ensure that the Indonesian legal system is not left behind in the face of AI disruption in higher education.

Furthermore, the results of this study are expected to serve as an initial reference for policymakers, both at the ministerial and educational institution levels, in designing responsive and dynamic AI regulatory instruments in Indonesia. The proposed regulations must ensure legal certainty regarding the status of AI-assisted scientific work, establish proportionate academic ethical standards, and emphasize the central role of humans in the scientific process. Thus, AI is positioned not as a threat but as a strategic instrument for increasing academic productivity, as long as its use remains within legal and ethical boundaries. This research also provides an important foundation for Indonesia to formulate policies that do not simply follow international trends but remain rooted in national scientific values and constitutional responsibilities in developing dignified, innovative, and ethical higher education.

The development of generative AI technology in academia has prompted various higher education institutions to respond through soft law instruments, such as academic ethics guidelines, internal university policies, and adaptive national policies. While this response demonstrates progressive ethical awareness, the soft law approach has not fully addressed the need for legal certainty in the context of copyright and academic integrity. Furthermore, the absence of positive norms explicitly governing the use of AI in scientific work creates a normative vacuum that could seriously impact the upholding of the principles of academic honesty, transparency, and accountability. This necessitates examining the position and function of soft law as a transitional bridge in AI governance in higher education, while simultaneously considering the urgency of establishing more binding formal regulations in the future.

However, nationally, the ethical approach to the use of artificial intelligence (AI) in academic settings in Indonesia remains fragmented and has not yet been integrated into a binding national regulatory system. To date, regulations regarding AI are still in the early stages of development (incipient stage), with a dominant soft law approach through internal university guidelines, such as those issued by the Directorate of Learning and Student Affairs (Belmawa) of the Indonesian Ministry of Education, Culture, Research, and Technology in the Guidebook for the Use of Generative AI in Higher Education (2024), which emphasizes the principle of prudence, transparency in the use of AI, and the prevention of automated plagiarism in the academic process.[24]as stated in page 15:

"Generative artificial intelligence (generative AI) can be used as a tool to support the learning process, for example in compiling references, checking spelling, or formulating initial ideas. However, AI is not permitted to take over the main role in scientific creation, such as developing critical arguments, concluding research results, or conveying original reflections." The guidelines emphasize transparency and academic responsibility, but do not yet have sufficient legal force and do not address in-depth normative issues such as authorship, academic validity, and AI-based ethical violations.

In line with the growing urgency of academic ethics in the digital era, global awareness is growing regarding the importance of establishing artificial intelligence (AI) governance that focuses not only on technological aspects but also places moral principles, scientific responsibility, and respect for human rights as the basic foundation. One reference instrument reflecting this approach is Regulation (EU) 2024/1689 on Artificial Intelligence (AI Act) issued by the European Union. This regulation was developed through a risk-based approach and places ethics as the primary framework for developing trustworthy AI. Article 95 of the AI Act encourages the development of voluntary codes of conduct to ensure the application of various ethical requirements to non-high-risk AI systems through internal governance mechanisms based on stakeholder participation.[25]This provision demonstrates that internationally, the existence of voluntary ethical guidelines is seen as an important instrument in building public trust and preventing early misuse of AI, including in the academic knowledge production space. In contrast, Indonesia currently lacks a national academic code of conduct that specifically regulates the use of AI in the preparation of scientific papers or the protection of academic integrity in the AI era. Existing policies are still sectoral and general, both through the Ministry of Communication and Informatics (Kemenkominfo) and the Ministry of Education, Culture, Research, and

[24]Directorate of Learning and Student Affairs, Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. Supra note 16. Page 15

[25]European Union, Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 March 2024 laying down harmonized rules on Artificial Intelligence (AI Act), Official Journal of the European Union, L 134, 13 May 2024, Article 95,https://eur-lex.europa.eu/eli/reg/2024/1689/oj, accessed August 17, 2025.

Technology (Kemendikbud-Ristek), potentially creating regulatory fragmentation and a normative gap in responding to academic integrity violations such as AI-generated plagiarism, AI-based writing manipulation, and claims of academic authorship without substantive human creative contribution. Therefore, establishing anticipatory and adaptive national ethical standards is an urgent need to ensure that the Indonesian legal system is not left behind in the face of artificial intelligence disruption in higher education. Thus, this research is highly urgent in providing conceptual and normative contributions in formulating a national ethical direction that can guide the responsible use of artificial intelligence (AI) in higher education institutions in Indonesia. Furthermore, this research also aims to propose a strengthening of the soft law-based regulatory framework that can be developed into a formal policy, not only adaptive to technological developments but also capable of protecting academic integrity and guaranteeing legal certainty regarding the status of scientific works involving AI as an auxiliary entity in the creation process.

B. RESEARCH METHODS

In this case, the author uses a normative legal research approach in the legal field, constructed on the basis of a study of legal principles, norms, dogmas, or rules, which are then analyzed comprehensively. However, the approach used in this research is normative-progressive, meaning it not only examines legal dogma statically but also reinterprets existing positive legal norms critically and adaptively to the development of Generative AI technology, which has not yet been fully accommodated in the current Indonesian legal system.

C. RESULTS AND DISCUSSION

General Overview of Copyright

Copyright is a fundamental pillar in the intellectual property law system, as it provides legal protection for original expressions manifested in the form of works in the fields of science, art, and literature. In the context of Indonesian positive law, copyright is comprehensively regulated in Law Number 28 of 2014 concerning Copyright (hereinafter referred to as UUHC). Article 1 number 1 of UUHC defines copyright as: "Copyright is an exclusive right for the Creator that arises automatically based on the declarative principle after a Creation is realized in a tangible form without reducing restrictions in accordance with the provisions of laws and regulations."[26] This definition confirms that the copyright protection system in Indonesia adheres to the declarative principle, namely that rights arise automatically from the time a work is expressed in a tangible form, without requiring a registration process. This principle is in line with international provisions in the Berne Convention for the Protection of Literary and Artistic Works (1886), particularly Article 5 paragraph (2) which states: "The enjoyment and exercise of these rights shall not be subject to any formality."[27]The translation is “enjoyment and exercise of these rights shall not be subject to any formal conditions.

This means that anyone who holds these rights has the right to use and utilize them directly, without having to go through certain administrative procedures or bureaucratic requirements first. Doctrinally, copyright provides protection for two main types of rights: moral rights and economic rights. Moral rights are inherent in the creator and cannot be transferred, including the right to remain listed as the creator and the right to reject changes that are detrimental to the creator's honor or reputation. Economic rights include the exclusive right to obtain commercial benefits from the use of the work, such as the rights of reproduction, distribution, communication to the public, and adaptation. This dualism concept is in line with articles 6 and 9 of the Copyright Law and is recognized in international law, especially the Berne Convention, which requires participating countries to provide protection for moral rights independently of economic rights. Historically, the development of the copyright concept is inseparable from the invention of the printing press by Johannes Gutenberg in the mid-15th century, which triggered the mass reproduction of written works and prompted the need for legal protection for intellectual works from piracy. In response to this problem, England enacted the Statue of Anne in 1710, which is recognized as the first copyright law in the world. This statute was an important milestone because it changed the paradigm of the royal privilege system where the king granted publishers monopoly rights to obtain legal recognition of the author's exclusive personal rights. In its considerations it was emphasized:

“An Act for the Encouragement of Learning, by Vesting the Copies of Printed Books in the Authors of Purchasers of such Copies, during the Times therein mentioned.”[28]

[26]Law Number 28 of 2014 concerning Copyright, Article 1 number 1.
[27]Berne Convention for the Protection of Literary and Artistic Works, Article 5(2)
[28]Statue of Anne, (8 Anne c.19), 1710.

Free translation: : "A law to encourage the advancement of knowledge, by granting the right to copies of printed books to authors or buyers of such copies, for the time period specified in this law.

The primary purpose of the Statute of Anne of 1710 was to encourage the creation and dissemination of knowledge by granting temporary legal protection to authors of their works. This was done as a normatively regulated incentive within the legal system, motivating authors to create and disseminate scientific, literary, and artistic works. Statute of AnneNot only was it the initial foundation of the copyright system in the UK, but it also inspired other copyright legal models around the world, including the common law (Anglo-Saxon) copyright system and the civil law-based droit d'auteur system in Continental Europe. These two systems subsequently developed with different approaches and theoretical justifications but shared a common goal: maintaining a balance between the rights of creators and the public interest in access to information. As Lionel Bently and Brad Sherman explain:
"The Act introduced an important innovation: authors were recognized as the legal owners of the copies of their works for a limited term. This principle, though conceived in the context of printed books, has come to underpin copyright law as we know it."[29]
Translation:

"This law introduced a significant innovation: authors were recognized as the legal owners of copies of their works for a specified period. This principle, although originally applied to printed books, is now the foundation of copyright law as we know it."

Thus, the existence of the Statute of Anne has paved the way for the modern copyright system, which upholds the balance between the private interests of creators and public access to intellectual works.

In the context of legal philosophy, John Locke was a central figure in formulating the normative basis for private property rights, including copyright. Locke developed a theory of natural rights, which is based on the assumption that every individual has property rights over themselves and the fruits of their labor. In his famous work, *Two Treatises of Government*, Locke stated:
"Every man has a property in his own person. This nobody has any right to but himself. The labor of his body, and the work of his hands, we may say, are properly his."[30]
Translation:
"Everyone has the right to own his own property. No one has any right to it except himself. The energy of his body and the work of his hands, so to speak, are his rightful property."

This view provides a strong philosophical basis for the theoretical justification of copyright, as it asserts that creative works are the result of human expression of energy and thought, deserving of legal recognition and protection as private property. In this approach, copyright is not merely a product of a social contract or formal provisions, but rather a form of moral recognition of the personal relationship between the creator and his or her creation. As a further development, Georg Wilhelm Friedrich Hegel emphasized that creative works are an extension of the creator's personality (personality theory). According to Hegel, creations not only represent the results of physical labor but also reflect the will and personal expression of their creators, thus establishing a spiritual connection between the subject of creation and the object of their creation. Therefore, copyright legal protection is interpreted as a form of recognition of human self-expression in these creations.[31] Meanwhile, from Immanuel Kant's perspective, copyright is seen as part of the right to moral freedom (moralische Freiheit), which allows humans to autonomously express their reason through works. Kant argued that legal protection is necessary to maintain the authenticity of the creator's will and intentions, so that unauthorized use of another's work is considered a violation of the creator's moral freedom. Thus, copyright has a strong ethical-normative basis as a right inherent in human dignity and freedom.[32] In contrast, the utilitarian approach, deeply rooted in Anglo-American legal philosophy and developed by Jeremy Bentham, emphasizes that the basis for the legitimacy of copyright granting is its ability to generate collective social benefits. In his moral philosophy, Bentham put forward the greatest principle as a benchmark for ethics:
"It is the greatest happiness of the greatest number that is the measure of right and wrong."[33]Translation:
“The greatest happiness for the greatest number of people is the measure of right and wrong.”

[29]Lionel Bently and Brad Sherman, Intellectual Property Law, Fourth Edition, (Oxford: Oxford University Press, 2014), pp. 4-5.
[30]John Locke, Two Treatises of Government, ed. Peter Laslett (Cambridge: Cambridge University Press, 1988), Second Treatise, §27.
[31]GWF Hegel, Philosophy or Right, ed. Allen W. Wood (Cambridge: Cambridge University Press, 2018), p 49
[32]Immanuel Kant, The Metaphysics of Morals, ed. Mary Gregor (Cambridge: Cambridge University Press, 1996), p 38 1996), p
[33]Jeremy Bentham, An Introduction to the Principles of Morals and Legislation (Clarendon Press, 1996), p. 14.

In this context, copyright is considered valid not because of the creator's moral or natural ownership of their work, but because such a protection system will encourage the production and dissemination of works that are widely beneficial to the public. This means that copyright is a public policy tool, not simply a moral recognition.

Furthermore, economic incentive theory views copyright as a mechanism for creating market incentives through temporary exclusive protection. This protection is necessary to ensure legal certainty and provide a return on creative investment. Daniel Gervais, a contemporary copyright expert, asserts:

"Copyright law creates incentives by granting temporary monopolies that encourage authors and investors to develop and publish creative works."[34]

Translation:

“Copyright law creates incentives by granting temporary monopolies that encourage creators and investors to develop and publish creative works.”

These two approaches, utilitarian and economic, form the basis for the formation of a modern copyright legal system that balances the interests of creators and public access to knowledge.

In the context of the Indonesian legal system, the Copyright Law explicitly stipulates the principle of originality as the primary requirement for a work to receive copyright protection. This provision is reflected in Article 1, number 3 of the Copyright Law, which defines a work as:

"Every creative work in the fields of science, art and literature that is produced by inspiration, ability, thought, imagination, dexterity, skill or expertise expressed in a tangible form."[35]

This definition emphasizes that the concrete expression of human creativity is an essential criterion for protection, while also distinguishing between ideas (which are abstract) and expressions of ideas (which are concrete and protectable). Thus, the principle of originality essentially requires a minimum intellectual contribution (creative choices) from the creator that can be visibly demonstrated through the work's manifestation in a tangible form (fixation doctrine).

However, with the development of Generative Artificial Intelligence (AI) technology, the line between human creation and automated output is blurring. Modern AI systems can generate original content without direct human involvement in the creative process, but rather through training on data and algorithms. This raises an important legal debate: are AI-generated creations entitled to copyright protection? And if so, who can legally be recognized as their creator?. Most national and international legal systems still require substantial human involvement in the creation of a work to obtain legal recognition of copyright. In line with this view, Daniel J. Gervais emphasizes that:

"Copyright authorship requires a minimum degree of human intellectual contribution. The originality requirement is not met by a mechanical or automatic process."[36]

Translation:

"Authorship under copyright law requires at least some human intellectual contribution. The requirement of originality cannot be met through mechanical or automated processes alone."

This statement clarifies the contemporary legal position that rejects copyright recognition for pure AI results without human intellectual touch, because the existence of the creator as a legal subject is an essential element in the modern copyright structure. The challenges of legal regulation of Artificial Intelligence (AI)-based works are becoming increasingly complex in Indonesia due to the lack of positive legal provisions explicitly governing the legal status of AI-generated creations. In this context, a progressive re-examination of the concepts of "creation" and "creator" as defined in the Copyright Law is necessary. This is crucial to address the shifting technological paradigm in the world of intellectual property. One relevant conceptual approach to addressing these challenges is the progressive legal approach developed by Satjipto Rahardjo, which emphasizes that law should not be understood rigidly, but rather should be responsive and adaptive to social developments and changing times. Satjipto Rahardjo stated:

"Law must be seen as an institution that never stops and continuously seeks justice and functions to organize human life better."[37]

This approach positions law not merely as a normative text, but as a dynamic tool of social engineering. Therefore, in the face of the development of AI, the definitions of "creation" and "creator" in the UUHC must be

[34]Daniel J. Gervais, The TRIPS Agreement: Drafting History and Analysis, 4th ed. (London: Sweet & Maxwell, 2012), p. 486.
[35]Article 1 number 3 UUHC
[36]Daniel J. Gervais, The Machine as Author, Iowa Law Review, Vol. 105, no. 5, 2020, p. 2107.
[37]Satjipto Rahardjo, “Progressive Law”, (Jakarta: Kompas, 2009), p. 62.

interpreted contextually to ensure they do not lose relevance to contemporary technological realities. Within this framework, a conceptual and philosophical understanding of copyright doctrine is crucial. This doctrine serves as the normative basis for assessing whether a work produced with the assistance of, or entirely by, AI can be recognized as a "creation" under Indonesian law. Furthermore, it serves as the basis for formulating appropriate legal protection to address the challenges of the legal vacuum (rechtsvacuum) that persists in the current Copyright Law. An explanation of this basic copyright concept is crucial as a foundation for understanding the new challenges arising from the development of Generative AI technology, which will be discussed further in the next subsection.

The Concept of Originality and Creativity in Law Number 28 of 2014 concerning Copyright

In the Indonesian copyright legal system, there are three main elements that serve as the foundation for determining whether a work is worthy of legal protection: originality, creativity, and fixation. These three concepts are not merely technical terms in legislation, but also have significant legal implications for the validity and sustainability of copyright over a work. The existence of these elements demonstrates that copyright protection is not granted arbitrarily, but must meet certain intellectual standards rooted in an individual's ability to produce new and authentic works that are concretely realized. The concept of originality, in the context of national law, is explicitly formulated in Article 1 number 3 of the Copyright Law. This article states that:

"Creation is any creative work in the fields of science, art and literature that is produced by inspiration, ability, thought, imagination, dexterity, skill or expertise expressed in a tangible form."[38]

This definition demonstrates that the element of originality requires active, intellectual human involvement in the creation process. In other words, originality cannot be attributed to results produced entirely by mechanical or automated processes, especially without the intervention of the creator's ideas and personal expression. An original work must reflect the unique contribution of the human mind or imagination, not derived from mere copying but from a creative process that produces an unprecedented form of expression.

Creativity, as an integral part of originality, is understood as individual and subjective creativity. This does not mean the work must be completely new, but rather simply demonstrates the creator's personal touch that sets it apart from other existing works. Creativity can take the form of style, structure, or the combination of previously unrelated elements. Meanwhile, fixation refers to the embodiment of a creation into a concrete or tangible form that can be seen, heard, or perceived by the five senses. Fixation is a requirement for a creation to be more than just an abstraction or idea, but to have gone through the stage of realization into an identifiable medium. Thus, fixation serves as the starting point for copyright protection, because without an objectively recognizable form, it is difficult to establish the boundaries and validity of a copyright. As emphasized by Pratiwi Eka Sari, the elements of originality and fixation must be understood as an inseparable part of the structure of the Indonesian copyright legal system, in order to be able to answer the challenges of modern developments, including in dealing with technology-based works such as artificial intelligence:

"Originality and fixity are not merely technical requirements, but must be seen as guarantees for the protection of authentic and legally verifiable creative expression."[39]

In other words, copyright protection is not solely intended to grant exclusive rights to creators, but also to ensure legal certainty for the public in recognizing the boundaries of protected creations. Therefore, understanding these three elements is crucial in establishing a copyright legal system that is responsive to current developments, including the challenges posed by the advent of generative AI technology, which is beginning to blur the boundaries between human and machine creation.

Unlike the common law legal system in the United States, which in the landmark case of Feist Publications v. Rural Telephone Service Co. adopted the principle of "modicum of creativity," the Indonesian legal system, rooted in the civil law tradition, places greater emphasis on the aspect of human intellectual contribution in determining the originality of a work. In the Indonesian context, originality is interpreted not only as newness of form or content, but as an expression of an original intellectual process, not the result of imitation or mechanical reproduction. This is in line with the view of Daniel J. Gervais who stated that "originality implies an intellectual creation that reflects the

[38]Article 1 number 3, UUHC
[39]Pratiwi Eka Sari, "The Need to Expand the Doctrines of Originality and Fixation in Copyright Law as Protection of the Creativity of the Nation's Children," Dharmasisya: Jurnal Magister Hukum FHUI, Vol. 1 No. 1 (2021): p. 444, available athttps://scholarhub.ui.ac.id/dharmasisya/vol1/iss1/10/, accessed July 1, 2025.

personality of the author."[40]Thus, there is a personal dimension inherent in original works, which cannot be replaced by imitations or automated productions, including those produced by AI systems. Creativity, although not explicitly mentioned in the Copyright Law, is the essence underlying the recognition of the moral and economic rights of creators. Creativity in this context is not merely technical or aesthetic innovation, but also reflects the expression of personality and the values embodied in the creation. In the worlds of art, science, and literature, creativity distinguishes works that possess original and authentic value from copies or digital manipulations that lack human creative touch. Without creativity, originality becomes hollow and lacks substantial legal meaning.

Fixation is a material aspect that determines the legal existence of copyright. Article 1, number 1 of the Copyright Law, stipulates that copyright arises after a work is manifested in a tangible form. This means that the work must be recognizable, perceptible, or demonstrable through the senses and must be available in a specific medium, whether in writing, images, sound, recordings, or other digital formats. Without fixation, claims to a work cannot be legally proven. Fixation serves as proof of the existence of the claimed work and is a primary requirement for legal protection granted by the state. Internationally, the principle of fixation is one of the main foundations of the copyright legal system. This principle is reflected in the Berne Convention for the Protection of Literary and Artistic Works, particularly Article 5 paragraph (2), which emphasizes the principle of "no formality." This means that member countries are not permitted to require administrative registration as a prerequisite for copyright protection. Copyright automatically applies from the moment a work is created, without the need for formal registration.

"The enjoyment and exercise of these rights shall not be subject to any formality."[41]

Free Translation:

"Enjoying and exercising these rights is not subject to any formalities."

Consequently, member states are given the freedom to determine technical standards for fixation, as long as they do not impede this automatic protection. In Indonesia, this principle is accommodated through Article 1, number 1 of the Copyright Law, which states that copyright is an exclusive right of the creator that "arises automatically after a work is manifested in a tangible form."

However, in the digital age and artificial intelligence (AI), serious challenges arise to three key principles of copyright: originality, creativity, and fixation. For example, can a work generated entirely by AI be considered original without human intellectual intervention? Can algorithms represent personal expression as defined by the creativity framework of copyright law? And can digital output from AI created without human creative intent be considered fixation?

Addressing these challenges requires a more flexible approach. A progressive legal approach, as developed by Satjipto Rahardjo, is relevant. In his thinking, he asserts that:

"The law should not be rigid, because the law is for humans, not humans for the law."[42]

In that spirit, the interpretation of the concepts of originality, creativity, and fixation needs to be reconstructed to remain contextual and address the legal vacuum in the contemporary technological landscape.

The Development of Generative AI and Its Relation to the Scientific World

The rapid development of artificial intelligence (AI) technology, particularly in the form of generative AI, has created significant disruption in various sectors, including education and the production of scientific papers. Generative AI is a type of AI capable of generating new content, such as text, images, audio, and programming code, by imitating previously trained data patterns. According to the Academic Ethics Guidelines published by the Directorate of Learning and Student Affairs, Ministry of Education, Culture, Research, and Technology (2023), scientific papers are the result of intellectual work compiled based on methodological principles, upholding the principles of originality, academic integrity, and the author's moral responsibility for the accuracy of the content and the impact of the publication.[43]In an academic context, this technology has the potential to fundamentally change the process of creating scientific work, from writing articles, compiling arguments, to presenting visual data.

[40]Daniel J. Gervais, :The Idea of Authorship in Copyright", (Iowa Law Review, Vol. 89, 2004), p. 402.

[41]Berne Convention for the Protection of Literary and Artistic Works, Article 5(2), available at:https://wipolex.wipo.int/en/text/283693. accessed on July 1, 2025

[42]Satjipto Rahardjo, supra note 12, p. 20.

[43]Directorate of Learning and Student Affairs, Ministry of Education, Culture, Research, and Technology, Guidelines for Academic Ethics in Higher Education (2023), p. 2, https://lldikti3.kemdikbud.go.id/wp-content/uploads/2024/11/Buku-Panduan-_-Penggunaan-Generative-AI-pada-Pembelajaran-di-Perguruan-Tinggi-cetak.pdfaccessed on June 28, 2025

Normatively, Indonesian copyright law does not yet provide explicit provisions regarding the legal status of works produced by AI technology. Yet, the use of generative AI such as ChatGPT, DALL·E, and Copilot is now increasingly common among academics and students. This creates a legal vacuum that can give rise to ethical dilemmas and legal liability. The term "legal vacuum" refers to the absence or unclear regulation of positive legal norms regarding a phenomenon, thus giving rise to the need for new legal interpretations or the creation of more adaptive norms.[44]For example, in the context of writing a thesis, can a student who uses ChatGPT as an aid still be considered the sole author of the work? Or should a new category, such as co-authorship with AI, be created?

On the other hand, sociologically, this phenomenon has given rise to new academic practices that require a rethinking of ethical norms, scientific honesty, and the concept of authorship responsibility. Research by Trisha Pritikin and colleagues published in Academic Medicine states that:

"The use of generative AI in academia may undermine core values of academic integrity unless appropriately regulated and transparently disclosed."[45]

Free translation:

"The use of generative AI in academia can undermine core values of academic integrity if not properly regulated and transparently disclosed."

Consequently, a paradigm shift is needed in understanding the relationship between technology and law, including a reinterpretation of the concepts of originality, creativity, and fixation in a contemporary context. Legal principles must not stagnate amidst change but must be able to respond progressively to social and technological dynamics.

Satjipto Rahardjo's progressive legal approach underscores this urgency. He states that:

"The law must be alive and constantly changing to meet the needs of a dynamic society."[46]

The normative approach in Indonesian law still needs to strengthen the position of humans as legal subjects at the center of creative action. The precautionary principle must be prioritized to prevent the recognition of exclusive rights over products that do not actually reflect human intellectual contributions. Within this framework, Satjipto Rahardjo's progressive legal approach is crucial. He also reminds us that "law is human," and therefore, law must continue to thrive and evolve to respond to the dynamics of the times. Thus, the phenomenon of generative AI in scientific work is not merely a technological event, but rather a discursive field that challenges our perspective on fundamental concepts in copyright law and academic ethics.

Academic Ethics and AI Generated Plagiarism

The development of artificial intelligence (AI), particularly generative AI such as ChatGPT, Bard, and Claude, has opened a new chapter in the scientific creation process, while simultaneously posing a serious threat to academic integrity. On the one hand, this technology offers efficiency, accessibility, and ease in the preparation of scientific manuscripts. However, on the other hand, the use of AI without a clear understanding of ethics can lead to academic deviations, particularly in the form of covert plagiarism (hidden plagiarism) that is difficult to detect with conventional plagiarism detection tools. This situation has given rise to confusion about the line between the use of AI as a legitimate tool and a violation of academic norms.

Academic ethics itself is a set of moral principles that demand scientific honesty, originality, intellectual responsibility, and openness to sources and contributions. When someone uses AI to produce scientific work and claims it as original without proper declaration or attribution, it fundamentally violates academic ethics because it obscures human intellectual contributions that should be honest and transparent. The Committee on Publication Ethics (COPE) asserts:

"AI tools cannot be listed as an author and authors are responsible for the integrity of all aspects of their work, including the use of such tools. The use of AI tools in the writing process should be disclosed transparently."[47]

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[44]Soerjono Soekanto, Introduction to Legal Research (Jakarta: UI Press, 2012), pp. 42-45.

[45]Trisha Pritikin et al., "Addressing the Novel Implications of Generative AI in Academic Publishing," source journal Academic Medicine, Vol. 99 No. 5 (2024), p. 510.https://journals.lww.com/academicmedicine/fulltext/2024/05000/addressing_the_novel_implications_of_generative_ai.1.aspxaccessed on August 18, 2025

[46]Satjipto Rahardjo, supra note 12, p. 20.

[47]Committee on Publication Ethics (COPE), Authorship and AI Tools: "Position Statement" (2023), https://publicationethics.org/guidance/cope-position/authorship-and-ai-tools accessed on August 18, 2025

Free Translation:

> "AI tools cannot be credited as authors, and authors remain responsible for the integrity of all aspects of their work, including the use of such tools. The use of AI tools in the writing process must be transparently disclosed."

A similar recommendation was also voiced by UNESCO in its Recommendation on the Ethics of Artificial Intelligence (2021). In the document, UNESCO urges member states to encourage higher education institutions to develop internal policies to safeguard the integrity of research and education when AI technologies are used in academic settings. One section states:

> "Member States should encourage academic institutions to adopt policies that preserve the integrity of research and education when AI tools are used."[48]

Free translation:

> "Member states should encourage academic institutions to establish policies to safeguard the integrity of research and education when using AI tools."

In the Indonesian context, written regulations regarding the use of AI in scientific writing are still limited. However, substantively, the principles of academic ethics are stipulated in various university-level regulations, including the Thesis and Dissertation Writing Guidelines applicable at the Faculty of Law, Parahyangan Catholic University. These guidelines emphasize that all scientific work must be original, include complete sources, and contain no elements of plagiarism, either directly or indirectly. If the use of AI technology is carried out without adequate declaration or attribution, such action can be classified as academic misconduct and potentially subject to ethical and administrative sanctions in accordance with university regulations.

Within the normative legal framework, the principle of originality as stipulated in Article 1 number 3 of the Copyright Law states that creations must result from human "inspiration, ability, thought, imagination, dexterity, skill, or expertise" and be expressed in a tangible form. This interpretation emphasizes that the intellectual substance of a work cannot be fully generated by an automated system without human contribution. Therefore, if the work produced by AI does not involve active human intervention in the creative process, the validity of the principle of originality becomes questionable.

As a solution, the progressive legal approach developed by Satjipto Rahardjo can serve as a reference in responding to this challenge. Satjipto emphasized that law should not be rigid or trapped solely in normative texts, but rather must be alive and adapt to changing times:

> "The law must not be separated from humans and the realities faced by their society."[49]

This approach emphasizes the need for the law to move adaptively and responsively in regulating the use of AI, so that scientific integrity is maintained without hindering the use of the technology.

Thus, the application of academic ethics in the use of AI is the main foundation before entering into a discussion of the normative principles of copyright which will be analyzed in the next sub-chapter.

Legal Theory and Ethical Approach

In examining legal developments related to the use of artificial intelligence (AI) technology in scientific writing, a theoretical approach is crucial. The development of AI, particularly generative AI such as ChatGPT, Claude, and Gemini, has challenged classical understandings of legal subjects, intellectual creation, and the limits of copyright protection. Therefore, a legal theory is needed that positions law not merely as a rigid normative rule but as a living and evolving tool.

One highly relevant legal theory is the Progressive Legal Theory developed by Satjipto Rahardjo. Within this framework, law is viewed as a means to achieve substantive justice, not merely procedural justice. Law must be responsive to social and technological changes and directed toward serving humanity. Satjipto explicitly states that: "Law is not for the sake of law itself, but for humanity. Law must be responsive to the realities faced by society."[50]

In the context of the use of AI in the academic realm, this theory suggests that copyright law should not be fixated on a rigid definition as contained in Article 1 number 3 of Law No. 28 of 2014 concerning Copyright, but rather be open to reinterpretation to accommodate the dynamics of digital technology and the characteristics of new creations based on algorithms.

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[48]UNESCO, Recommendation on the Ethics of Artificial Intelligence, 2021, Article 28(c), p. 12,https://unesdoc.unesco.org/ark:/48223/pf0000381137accessed on August 21, 2025

[49]Satjipto Rahardjo, supra note 12, p. 62.

[50]ibid, p. 18.

In addition to a progressive legal approach, an ethical framework is also needed to normatively support these regulations. Two main approaches are deontological ethics and virtue ethics.

Deontological ethics, rooted in the moral philosophy of Immanuel Kant, emphasizes that an action can be judged ethical if it is based on moral obligation, not merely its consequences or benefits. In an academic context, this principle demands that scientific integrity be upheld as a form of ethical obligation, where each individual is responsible for the authenticity of their work and does not conceal the use of technology such as AI as a writing aid. Kant wrote:

"Act only according to that maxim whereby you can, at the same time, will that it should become a universal law."[51]

Translation:

"Act only according to principles which you, at the same time, can will to become universal laws."

Meanwhile, Aristotle's Virtue Ethics emphasizes the importance of developing moral character and good habits in academic life. According to Aristotle, virtue results from the continuous practice of choosing good actions based on reason and a noble purpose in life (eudaimonia). In practice, this encourages academics to practice honesty, responsibility, and respect for the scientific process, including when using AI. In the Nicomachean Ethics, Aristotle states:

"Moral virtue comes about as a result of habit. We become just by doing just acts, tempered by doing temperate acts, brave by doing brave acts."[52]

Translation:

"Moral virtue is formed from habit. We become just by doing just acts, wise by acting wisely, and brave by acting bravely."

These two ethical approaches reinforce the point that the use of AI in scientific writing should not negate human contributions. If the work is entirely generated by AI without any declaration or clarification, it could be considered a violation of the principle of originality, a key requirement for copyright protection.

Thus, this progressive legal theory and ethical approach provides an important analytical and normative framework for evaluating and responding to the legal and ethical complexities surrounding the use of AI in academia.

The concept of originality holds a crucial position in copyright law, as it is a prerequisite for a work to be considered a creation worthy of protection under the Copyright Law. Article 1, number 3 of the Copyright Law states:

"Creation is any creative work in the fields of science, art and literature that is produced by inspiration, ability, thought, imagination, dexterity, skill or expertise expressed in a tangible form."

This formulation indicates that copyright protection is granted only if the work is born from creative human activity and is manifested in a tangible form perceptible to the five senses. These two elements serve as the initial screening for any work seeking to be claimed as copyrighted in Indonesia.

Furthermore, Article 1 number 2 of the Copyright Law defines a creator as:

"a person or several people who individually or together produce creations that are unique and personal."

This means that the Indonesian copyright system is based on an anthropocentric paradigm, namely that protection is only granted to human legal subjects who have the ability to think, will, and can be held accountable for their creations. In Ahmad M. Ramli's view, originality is not merely an element of novelty, but rather emphasizes the existence of personal expression and creativity that reflects the creator's unique characteristics, thus distinguishing it from mechanical reproduction.[53]

This view is in line with what is called the "creator's personality theory", namely the theory which states that a creation must reflect the personality, thoughts and characteristics of its creator, not just the result of technical duplication or machine-made without a personal touch. In the context of AI-based scientific works, copyright protection is still essentially possible, as long as there is creative human intervention, for example through the preparation of prompts, curation, editing, or other artistic control, so that the final result reflects the expression and personality of the creator. Conversely, if the AI output is accepted at face value without human creative contribution, the work potentially lacks the element of originality and thus cannot be qualified as a "creation" under the Copyright Law.[54]This view is in line with the economic incentive theory, which positions copyright as an instrument to provide

[51]Immanuel Kant, supra note 7, p. 30.
[52]Aristotle, Nicomachean Ethics, trans. WD Ross (Oxford: Oxford University Press, 2009), p 29.
[53]Ahmad M. Ramli, Indonesian Copyright Law in the Perspective of Practice and Theory (Bandung: Alumni, 2017), p. 36.
[54]WIPO, Copyright and Artificial Intelligence: Dialogue with the Scientific Community, p. 4,https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdfaccessed on August 17, 2025

incentives to human creators by granting temporary exclusive rights to their original works.[55] Thus, normatively it can be emphasized that AI users can only be recognized as creators if their involvement is creative, through merely mechanistic actions, and is able to reflect intellectual expression and personal characteristics in the final results of the AI-based scientific work produced.

After discussing the requirements for originality and the creator's position, the next discussion focuses on who is legally responsible and who has the right to own copyright for AI-based scientific works. This section is important considering that AI output is often the result of the work of automated systems, while Indonesian copyright regulations place legal responsibility solely on human legal subjects. After discussing the requirements for originality After discussing the requirements for originality and the creator's position, the next discussion focuses on who is legally responsible and who has the right to own copyright for AI-based scientific works. This section is important considering that AI output is often the result of the work of automated systems, while Indonesian copyright regulations place legal responsibility solely on human legal subjects. Under the Copyright Law, legal responsibility for a creation can only be attributed to the individual or legal entity that holds the status of creator or copyright holder. This means that AI, as an algorithmic system, cannot be considered a legal subject because it lacks will, reason, or moral responsibility.[56]Thus, if a scientific work is produced with the help of AI, the creator or copyright holder must still be a human or legal entity that uses the AI.

The Copyright Law opens up space for the transfer of copyright through agreements, inheritance, gifts, or other legally justified reasons (Article 16), but still places the initial source of responsibility on the human creator.[57] Therefore, in the context of AI-based scientific work, AI users will be held legally responsible if violations occur, even if the creation process is automated. In addition, based on the principles of benefit and justice, copyright remains in place as a form of incentive protection for human creators.[58]Therefore, copyright ownership of AI-generated scientific works can be vested in the user if they can demonstrate creative contribution, control, and oversight of the creation process. This situation also creates an ethical and legal obligation for users to be transparent in acknowledging the role of AI and ensuring there are no misleading claims of ownership. Thus, normatively it can be concluded that AI cannot be a legal subject that has copyright or is responsible for creations, so that human users still hold a central position as owners and responsible parties, as long as they fulfill the requirements for creative contribution.

Regarding the moral and economic rights of AI-based scientific works, every work that meets the requirements of originality and has an author according to the Copyright Law is inherently entitled to two forms of protection: moral rights and economic rights. In the context of Artificial Intelligence (AI)-based scientific works, the distinction between these two types of rights is crucial for assessing the extent of protection granted and who is entitled to it. Normatively, moral rights are regulated in Article 5 paragraph (1) of the Copyright Law, moral rights as referred to in Article 4 are rights that are personally inherent in the Creator to: (a) continue to include or not include his name on copies in connection with the use of his Creation for the public; (b) use his alias or pseudonym; (c) change his Creation in accordance with propriety in society; (d) change the title and subtitle of the Creation; (e) defend his rights in the event of distortion of the Creation, mutilation of the Creation, modification of the Creation, or anything that is detrimental to his honor or reputation.[59]Moral rights are inherent to the individual and cannot be transferred, even if the economic rights are transferred. Therefore, in scientific works that use AI as a creative tool, moral rights must remain vested in the human creator, as long as that human makes a tangible creative contribution. Moral rights cannot be assigned to AI because AI is not a legal subject possessing dignity, identity, or personality. In contrast to moral rights, economic rights are regulated in Article 8 and Article 9 of the Copyright Law, which gives creators or copyright holders the authority to obtain economic benefits from their creations, such as the right to reproduce, translate, adapt, distribute, display and announce the creations.[60]These economic rights can be transferred to another party through agreement, inheritance, or other legitimate means. In the context of AI-based scientific works, this means that as long as a human can be proven to be the creator or copyright holder (through creative intervention), their economic rights can still be enjoyed or transferred, regardless of the fact that some of the creative

[55]Daniel J. Gervais, The Machine as Author, Iowa Law Review, Vol. 105 No. 5 (2020), p. 2055,https://ilr.law.uiowa.edu/sites/ilr.law.uiowa.edu/files/2022-10/The%20Machine%20as%20Author%20.pdfaccessed on August 17, 2025.
[56]Ahmad M. Ramli, supra note 1, p. 37.
[57]Law Number 28 of 2014 concerning Copyright, hereinafter written (UUHC), Article 16.
[58]Daniel J. Gervais, supra note 3, p 2058
[59]Article 5 of the UUHC
[60]Ibid. Article 9

process is performed by a machine. Problems arise when human involvement in the creation of AI-generated works is minimal or difficult to verify. Under these circumstances, moral rights cannot be assigned to AI, while economic rights are also questionable due to the lack of originality. This means that the protection of moral and economic rights can only be enforced if the work can be intellectually justified by the human creator. Otherwise, the work may be legally deemed non-copyrightable or simply treated as a work in the public domain, thus deprived of copyright protection.[61]

Thus, moral and economic rights in AI-based scientific works remain vested in humans as creators, as long as they demonstrate creative expression and control over the creation process. AI is viewed solely as a means or tool for realizing creative expression, not as a subject of rights. This reading reaffirms that the normative framework of the Copyright Law still relies on the protection of human authorship, which will then form the basis for the formulation of ethical policies and regulatory recommendations discussed in the following chapter. Regarding legal subjects and legal liability in generative AI work, the existence of the legal subject creator plays a central role in determining who receives legal protection and who must bear responsibility in the event of a violation. Under the Indonesian Copyright Law, this legal subject is limited to humans (individuals) or legal entities, who can act as creators or copyright holders.[62]AI, despite having the ability to produce output automatically through machine learning algorithms, is not legally included in the status of a legal subject, because it does not have will, feelings (emotions), or moral responsibility as characteristics inherent in humans as creators.

When AI technology is used in the creation of scientific works, the question arises as to who should hold copyright and legal responsibility for the work. In the Indonesian legal system, AI is positioned solely as a technical aid (instrumentum), so users, researchers, or institutions operating AI automatically assume the role of creator and copyright holder, as long as they contribute creatively, provide direction, or control over the resulting work.[63]This accountability model is referred to as human-based liability, where the basis for imposing responsibility is based on the active involvement of humans in the creative process of producing AI-generated works. In international legal practice, there are several theories regarding who should be held responsible if a work created using AI raises legal issues. The first is the direct liability approach, where the AI user is considered the direct creator, so all legal responsibility—whether for copyright infringement, academic ethics violations, or losses to third parties—remains with the human AI user.[64]The second is the strict secondary liability approach, namely that legal responsibility is still directed at the user even if his creative role is small or only limited to pressing the generate button, because legally he is considered the party that caused the work to appear and be published (proximate cause).[65]

Furthermore, theoretical discourse on electronic personhood has developed, namely the idea of granting AI limited legal status as an "electronic entity," allowing it to be held responsible for its creations. However, this concept has not yet been accepted in the Indonesian legal system, as the Copyright Law only recognizes humans and legal entities as legal subjects.[66]Thus, legal responsibility for AI-generated scientific work in the context of Indonesian law remains with the human or legal entity that uses and publishes the work, not with the AI system itself. In the context of AI-based scientific work, the issue of legal liability encompasses not only whether AI can be considered a creator, but also concerns its implications for academic reputation, scientific integrity, and the potential for scientific misconduct. If AI-generated work is published by humans without any creative involvement in the process, it can be categorized as academic dishonesty, for which the manuscript owner or the author who impersonated it remains responsible. Therefore, AI users have full responsibility to ensure that the output used in scientific work has truly gone through an intellectual assessment process such as the selection, compilation, and presentation of intellectual works, such as ideas, knowledge, information, and reflects the author's own views, thoughts, and analysis. Thus, it can be emphasized that under the Indonesian positive legal system, AI does not have legal capacity as a creator or bearer of responsibility, so that legal responsibility for every AI-generated scientific work remains with the human or legal entity that uses it. This principle applies not only to copyright claims, but also to all legal and ethical consequences that arise if the work causes harm, violations or disputes to other parties. Generative AI technology has fundamentally transformed the knowledge production process in higher education. UNESCO, through its ChatGPT and Artificial Intelligence in Higher Education: Quick Start Guide (2023), emphasized that higher education

[61]Daniel J. Gervais, supra note 3, p. 2058.
[62]Article 1 numbers 2 and 3, UUHC
[63]Ahmad M. Ramli, supra note 1, p. 38
[64]Daniel J Gervais, supra note 3, p. 2055-2056
[65]Sean M. O'Connor, "AI and the Problem of Authorship," Vanderbilt Journal of Entertainment & Technology Law Vol.24 No.2 (2022), p. 216
[66]Ahmad M. Ramli, supra note 1, pp. 37–38.

institutions have a responsibility to ensure the ethical and responsible integration of AI into education and research activities.[67]Thus, the use of AI in scientific work cannot be seen solely as a technical activity, but also as a theme of academic governance that requires regulatory tools.

Globally, the regulatory gap (normative gap) in the copyright regime is increasingly evident because the existing legal framework is still based on the assumption of human-centric authorship, namely that works are only considered valid if they are born through human creativity. AI-based works that technically fulfill the element of tangible form are often difficult to protect because they do not arise from human creative intent. This condition encourages updates not only to the hard law aspect, but also the formation of institutional ethical policies (soft law) so that the use of AI remains within the corridor of scientific responsibility. This phenomenon is also evident in Indonesia, where Copyright Law No. 28 of 2014 still does not recognize AI as a creator, creating a normative vacuum that needs to be bridged through new regulations and policies.[68] In practice, in Indonesia, this legal gap is clearly illustrated by the Copyright Law, which does not yet recognize the concept of using AI in the creation of works, particularly scientific works. This results in the lack of standards for assessing the level of human contribution, the transparency of AI use, or the legal liability of AI users. From an academic perspective, uncontrolled AI use has the potential to alter perceptions of scientific integrity. Therefore, the urgency of regulatory reform is real and urgent, not only for legal certainty but also to maintain public trust in scientific works as products of human intellectual endeavor.

Formulating a hybrid regulatory framework for the use of Generative AI requires an understanding of two complementary normative instruments: hard law and soft law. Hard law refers to positive legal rules that are binding and give rise to legal obligations, such as statutes, government regulations, or ministerial regulations. These instruments are binding because their legal consequences are coercive and can result in sanctions if violated.[69]In the context of the use of AI in scientific works, hard law is needed as a form of legal certainty and accountability, especially to determine the limits of copyright protection, the legal subjects of creators, and the form of accountability of AI users in the event of violations of scientific works. Meanwhile,soft lawrefers to non-legally binding rules, but regulates behavior through ethical mechanisms, institutional policies, or internal disciplinary guidelines.[70]In higher education, soft law is reflected in academic codes of ethics, rector regulations, guidelines for writing scientific papers, and policies on statements, attitudes, or disclosures regarding the use of AI. These instruments do not have coercive power like laws, but they serve to maintain academic integrity, promote transparency in the use of AI, and establish limits on the permissible use of AI in the scientific writing process.[71]Thus, soft law becomes an important mechanism to ensure that the use of AI remains within the framework of academic honesty and does not give rise to ethical deviations in the world of scientific knowledge.

In the context of formulating a national regulatory framework, these two instruments should not be in conflict, but should be formulated in a complementary manner.Hard lawis tasked with providing a legal basis and certainty of copyright protection for AI-based scientific works, while soft law is tasked with ensuring that the use of AI in writing scientific works continues to comply with academic norms applicable in universities, such as scientific honesty, moral responsibility of authors, and the principle of originality of works.[72]With this kind of hybrid model, it is hoped that responsive and adaptive AI arrangements can be achieved, while still maintaining academic integrity as the main spirit of scientific work preparation.

Efforts to respond to the development of generative AI have also become a concern in the legal systems of

[67]UNESCO, ChatGPT and Artificial Intelligence in Higher Education: Quick Start Guide (2023),https://unesdoc.unesco.org/ark:/48223/pf0000385146accessed August 19, 2025.
[68]Bagus Gede Ari Rama, Dewa Krisna Prasada & Kadek Julia Mahadewi, "The Urgency of Regulating Artificial Intelligence (AI) in the Field of Copyright Law in Indonesia", Jurnal Rechtens, Vol. 12 No. 2 (2023), pp. 209–224,https://doi.org/10.56013/rechtens.v12i2.2395, accessed on August 19, 2025.
[69]R. Martono, Law as a System: Hard Law and Soft Law in the Perspective of Legal Theory, (Jakarta: Prenada Media, 2022), p. 93.
[70]IM Soekanto, Soft Law Instruments in the Formation of Community Legal Behavior, IUS QUIA IUSTUM Law Journal, Vol. 28 No. 3 (2021), p. 506.
[71]Parahyangan Catholic University Rector Regulation No. III/PRT/2020-09/103 2020 concerning Publication of Scientific Works of Masters Program Students of Parahyangan Catholic University, pp. 3-4.
[72]BGA Rama, The Urgency of Regulating Artificial Intelligence in Indonesian Copyright Law, Jurnal Rechtens, Vol. 12 No. 2 (2023), pp. 209–210.

several countries. The United States, through the US Copyright Office, has stated that works generated entirely by artificial intelligence cannot be protected by copyright unless there is creative human authorship in the creation process.[73]This policy reflects the view that AI is merely a tool, while copyright belongs to the humans who make expressive contributions to the creation. The UK adopts a different approach through the concept of limited authorship, where the use of AI is permitted as long as humans retain creative control and are accountable for the final results.[74]With this approach, the UK provides adaptive space for AI while maintaining the principle of personal responsibility. Japan, on the other hand, tends to adopt a more liberal strategy, allowing AI works that do not meet human creative requirements to enter the public domain directly, without copyright protection, as a compromise between technological innovation and the traditional principle of originality.[75]

A comparison of these three jurisdictions demonstrates that the direction of legal reform is global and adaptive to advances in AI. These countries are not only relying on legislative changes (hard law) but are also beginning to develop ethical guidelines, internal policies for higher education institutions, and disclosure mechanisms for the use of AI in scientific work (soft law). This regulatory framework serves as an important reference for Indonesia in formulating a hybrid regulatory framework that aligns with the characteristics of its national legal system while also responding to the challenges posed by generative AI in the development of scientific work. Based on this description, it can be understood that the development of generative AI has given rise to new needs in the governance of scientific works, which cannot be fully addressed by the current copyright legal system. On the one hand,hard lawAI remains necessary as a basis for legal certainty and copyright protection for scientific works involving human creative intervention. On the other hand, soft law in the form of higher education institution policies and academic ethics are crucial instruments for regulating the behavior and accountability of AI use by students and academics in the creative process. With the combination of these two instruments, it is hoped that a regulatory framework that is adaptive to technological disruption will emerge.

D. CONCLUSION

Based on the discussion in the previous chapters, the following conclusions can be drawn:

1. **The use of Generative Artificial Intelligence (AI) in writing scientific papers creates new legal needs.**, particularly regarding copyright protection, measures of originality, authorship, and academic integrity. Law Number 28 of 2014 concerning Copyright does not specifically regulate AI-based works, creating a normative gap when faced with the phenomenon of AI-generated content, which is increasingly used in academic activities. This situation demands an update to the legal regulatory framework to address the dynamic development of AI technology in higher education.
2. **PA hybrid regulatory approach that combines hard law and soft law is an ideal framework for facing these challenges.**Hard law is needed as a basis for law enforcement and to ensure copyright protection for scientific works, while soft law plays a crucial role in shaping the behavior of academics through codes of ethics, institutional policies, and internal oversight and disciplinary mechanisms. Collaboration between these two instruments allows for a balance between legal certainty and academic ethical flexibility in regulating the use of AI.

3. **Legal practices at the international level show a global trend towards AI governance based on soft governance and self-regulation.**, without abandoning the existence of formal legal sanctions. While there are policy variations among the United States, the United Kingdom, and Japan, all countries agree in principle that AI cannot replace humans as responsible creators (human authorship is mandatory). This concept provides an important foundation for Indonesia in formulating national policies that are not merely reactive, but anticipatory and in line with global regulatory developments.

[73]US Copyright Office, Copyright Registration Guidance: Works Containing AI-Generated Material (2023),https://www.copyright.gov/ai/ai_policy_guidance.pdf, “Copyright does not protect works produced entirely by an artificial intelligence.”, accessed 19 August 2025.
[74]UK Intellectual Property Office (UKIPO), Copyright and Artificial Intelligence Guidance (2022),https://www.gov.uk/government/consultations/artificial-intelligence-and-ip-copyright-and-patents, accessed August 19, 2025.
[75]Japanese Agency for Cultural Affairs, AI and Copyright Report, 2020, p. 10,https://www.bunka.go.jp/english/policy/copyright/pdf/94055801_01.pdf, accessed August 24, 2025.

4. **The ideal national regulatory framework offered includes a number of recommendations.**, that is:
    - **a.** Revise the Minister of Education, Culture, Research and Technology Regulation as the basis for higher education policy to require disclosure of the use of AI in all scientific works;
    - **b.** Affirmation through derivative regulations of UUHC that AI is only positioned as an assisting tool, not a legal subject of the creator;
    - **c.** Establishment of a national AI oversight body with the authority to conduct compliance certification and administrative enforcement of ethical and legal violations; and
    - **d.** The development of academic compliance indicators based on Trustworthy AI, including the mandatory SOP for AI-based writing, the use of AI-plagiarism detection technology, and the internalization of the principles of fairness, privacy, risk mitigation, and sustainability in the higher education quality assurance system.

Thus, it can be concluded that a hybrid regulatory framework that relies on the synergy of hard law and soft law is seen as the most ideal policy option to ensure that the use of Generative AI in scientific writing remains in line with the principles of originality, academic integrity, and legal responsibility in Indonesia.

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