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Sustainability as a guiding principle for copyright reform: regulating the use of generative AI in the field of research and education

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Abstract

This article analyzes the complex relationship between Generative AI (Gen AI), sustainability, and copyright, focusing on the use of copyrighted materials for research and education using a combined theoretical and conceptual methodology. On one hand, Gen AI can be transformative by enabling broader access to content, for example, by overcoming language barriers, compiling information in very large datasets, and enabling customized educational experiences [See O. A. Acar, "With Generative AI We Can Reimagine Education" (World Economic Forum, 19 February 2024). https://www.weforum.org/agenda/2024/02/with-generative-ai-we-can-reimagine-education-and-the-sky-is-the-limit/. Accessed 19 March 2025] that strengthen incentives to learn [T. Ingkavara et al., "The Use of a Personalized Learning Approach to Implementing Self-Regulated Online Learning", Computers and Education: Artificial Intelligence 2022, Vol. 3, 100086], thus helping to level the playing field in research and education. These functions contribute to fulfilling the right to education as provided by the Sustainable Development Goals (SDGs) of the United Nations, specifically, SDG4, and the right to research, as embodied in the human rights framework. On the other hand, Gen AI output poses risks in terms of false or lack of attribution to creators, lack of scientific integrity and manipulation of works, and prejudicing the moral interests of authors, which form part of the human rights framework. This article offers preliminary suggestions on how sustainability can be used as a guiding principle to find the right balance between facilitated access to knowledge for education and research and compliance with the moral rights of authors when dealing with Gen AI. The two pillars of this approach are (1) the set-up of a transparent and "human-centric" copyright framework regulating Gen AI and (2) an appropriate governance structure that can easily provide relief in case of moral rights violations prejudicial to research and education, as well as ethical innovation more broadly.

1 Introduction

The use of Generative AI (Gen AI) can enable such features as instant translation of materials into other languages, tracking and summarizing vast amounts of research materials, and providing engaging and "gamified" learning experiences. For research and learning activities, this opportunity to make knowledge more accessible to a wider audience, in terms of both language and format, is an important asset, particularly in enabling future innovation. However, the ability of Gen AI to generate vast amounts of content using copyright-protected works as training material raises several concerns and can undermine the recognition and control that authors have over their work, posing significant challenges for academic and scientific communities. These challenges strictly relate to copyright and sustainability because, on the one hand, students and researchers have a significant interest in being able to have broader/facilitated access to knowledge, which can be facilitated by Gen AI. On the other hand, the training of Gen AI with copyrighted materials should not compromise the rights of the authors of intellectual creation to being recognized as such, as well as to prevent biased information, which may lead to disinformation. In this respect, the need for students and researchers to have the widest possible access to materials is closely linked to the United Nations Sustainable Development Goals (SDGs) adopted in 2015.[1] Specifically, SDG4 urges Member States to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all", which is supported by several human rights, such as the right to education[2]; the right to research[3]; and the right to participate to progress, science, and culture while securing the moral and material interests of creators from a human rights perspective[4] (in the Universal Declaration on Human Rights and the International Covenant on Economic, Social and Cultural Rights, see *infra* Par. III).[5] In Europe, the principle of sustainable development is included in the DNA of the European Union, which is mentioned as a key objective in Article 3 (3) of the Treaty of the European Union, alongside the commitment to a highly competitive social market economy aimed at full employment and social progress; a high level of protection and improvement of the quality of the environment; and the promotion of scientific and technological advancement. At the same time,

[1] UN General Assembly, 'Transforming Our World: The 2030 Agenda for Sustainable Development' https://digitallibrary.un.org/record/3923923. Accessed 18 March 2025.

[2] On the link between SDG4 and the right to education see F. Di Lazzaro, 'Sustainable Development Goals and Copyright: A Proposal for Reform in the Field of Education', European Intellectual Property Review (EIPR) 2025, 47(2), p. 63 sq.

[3] On the right to research, see C. Geiger and B. J. Jütte, "Conceptualizing a 'Right to Research' and its Implications for Copyright Law, An International and European Perspective", American University International Law Review 2023, Vol 38, Issue 1, p. 1 sq.; S. Samtani, "Developing a Human Right to Research in International Law" (2023) Joint PIJIP/ TLS Research Paper Series 107, https://digitalcommons.wcl.american.edu/research/107 and S. Flynn, C. Geiger, J. P. Quintais et al., "Implementing User Rights for Research in the Field of Artificial Intelligence: A Call for International Action", EIPR 2020, Vol. 42, Issue 7, p. 393–398.

[4] See C. Geiger; "Taking the right to culture seriously: Time to rethink copyright law", in C. Geiger (ed.), "Intellectual Property and Access to Science and Culture: Convergence or Conflict?", CEIPI/ ICTSD publication series on "Global Perspectives and Challenges for the Intellectual Property System", Issue No. 3, Geneva/ Strasbourg, 2016, p. 84 sq.

[5] See UN General Assembly, 'Universal Declaration of Human Rights' Art. 26 and 27. https://digitallibrary.un.org/record/666853. Accessed 18 March 2025 and UN Economic and Social Council, 'International Covenant on Economic, Social and Cultural Rights' Art. 13 and 15. https://treaties.un.org/doc/treaties/1976/01/19760103%2009-57%20pm/ch_iv_03.pdf. Accessed 18 March 2025. On the relationship between SDG4 and human rights, see A. Wulff (ed.) "Grading goal four", Brill 2020, available at: https://brill.com/edcollbook-oa/title/57471 (Accessed: 19 March 2025). More broadly, on the interlinkages between SDGs and human rights see UN High Commissioner for Human Rights, 'Sustainable Development Goals to Human Rights Chart' (OHCHR) https://www.ohchr.org/sites/default/files/Documents/Issues/MDGs/Post2015/SDG_HR_Table.pdf. Accessed 18 March 2025 and I. T. Winkler and C. Williams, "The sustainable development goals and human rights: A critical early review", International Journal of Human Rights 2017, Vol. 21, Issue 8, p. 1023–1028.

at the EU level, the moral rights of the author are backed by the human rights framework (in the European Convention on Human Rights, see *infra* Par. III).[6] Therefore, a sustainable Gen AI copyright framework should balance access to materials for educational and research purposes with the protection of moral rights.

2 Methodology

This article focuses on the moral interests of creators and related fundamental rights issues, which—as recently recognized by a study requested by the European Parliament's Committee on Legal Affairs[7]—have been overlooked in the AI copyright debate[8] and are the most relevant in the field of research and education. By explicitly addressing this gap in the literature, this article offers a novel contribution through a combined theoretical and conceptual analysis of the intersection between Gen AI, sustainability, and copyright law. It advances current scholarship by integrating moral rights considerations into debates that have traditionally centred on economic rights, thereby reframing the regulatory challenges posed by AI in a manner that foregrounds ethical and sustainable dimensions. The theoretical component analyzes existing frameworks and doctrines in the SDGs and human rights frameworks. Complementing this, the conceptual component critically reviews the literature, legal texts, and policy documents to clarify and reinterpret key concepts, particularly the education imperative embodied in SDG4 and the right to research. Together, these approaches allow the identification of normative gaps and conceptual tensions in the current copyright framework, supporting the development of a coherent theoretical model that aligns copyright law with the objectives of sustainable development in the age of Gen AI. This interdisciplinary analysis proposes balanced policy recommendations that advance access to knowledge for education and research and the protection of authors' moral rights in an era of AI-driven change.

This article defines a sustainable copyright system as one that allows access to copyrighted materials by exploiting the transformative power of AI for research and education for scientific progress purposes[9] without disregarding the moral and material interests of the authors.[10]

[6] See 'European Convention on Human Rights' Art. 8 and 10. https://www.echr.coe.int/documents/d/echr/convention_ENG. Accessed 18 March 2025.

[7] See N. Lucchi, "Generative AI and Copyright—Training, Creation, Regulation", study Requested by the JURI Committee at the European Parliament, https://www.europarl.europa.eu/thinktank/en/document/IUST_STU(2025)774095. In this study, the author underscores the emerging significance of moral rights—particularly the right of integrity—as a critical regulatory focal point in the context of Gen AI, noting that growing authors' opposition to AI training with protected works reflects a paradigm shift toward safeguarding the ethical and reputational dimensions of authorship beyond traditional economic frameworks.

[8] This has focused so far on the on-material interest if creators and the economic rights, particularly with regard to the training of Gen AI with copyright protected works. However, see C. Geiger, "Elaborating a Human Rights Friendly Copyright Framework for Generative AI", International Review for Intellectual Property and Competition Law (IIC) 2024, Vol. 55, Issue 7, p. 1136; L. Oprysk, "GenAI, Free Speech, Author's Moral Rights?", IIC 2024, Vol. 55, Issue 3, p. 343.

[9] For a reflection on the need for an access-enabling copyright law, see C. Geiger, "Copyright as an access right: Securing cultural participation through the protection of creators' interests", in R. Giblin and K. Weatherall (eds), What if we could reimagine copyright? (ANU Press, 2017), p. 74–75; C. Geiger and B. J. Jütte, "Copyright as an Access Right: Concretizing Positive Obligations for Rightholders to Ensure the Exercise of User Rights", GRUR International 2024, Vol. 73, Issue 11, p. 1019 sq.

[10] The conceptualization of what can be considered a "sustainable copyright law" is still at an early stage. In this regard, with reference to the intersection between SDGs framework, specifically, SDG4, and copyright, sustainable copyright has been defined as a system that mandates equal and fair access to education materials disregarding class, gender, geographical location, disabilities and language. See F. Di Lazzaro, "Sustainable Development Goals and Copyright: A Proposal for Reform in the Field of Education", EIPR 2025, Vol. 47, Issue 2, p. 63 sq. On the link between copyright and sustainability in the field of education, see F. Di Lazzaro, "Designing Sustainable Copyright: the Education Impera-

The main purpose of this article is to consider how to align copyright provisions regulating Gen AI with the ethical principles of society as embodied in the SDGs and the universally recognized human rights framework. The rest of the paper proceeds as follows. The next two sections discuss the benefits and risks of Gen AI, respectively. We then discuss the ethical and cultural challenges of Gen AI with related to sustainability and copyright. The following section discusses the proposal for a sustainable copyright regime for Gen AI. The final section concludes.

3 The transformative power of generative AI in the field of research and education

Studies have proven that AI has significant benefits when it comes to research opportunities, such as the ability to improve content quality through writing assistance and support in handling large amounts of data, which in turn can ensure comprehensive analysis as well as enlarge and accelerate access to scientific material.[11] In addition, UNESCO has observed that the potential of AI within education is broad and covers four different functions: education management and delivery (e.g., educational chat bots), learning and assessment (e.g., dialogue-based tutoring systems), empowering teachers and enhancing teaching (e.g., AI-powered teaching assistants), and lifelong learning.[12] The World Economic Forum[13] similarly acknowledged the benefits of AI use within the education sector, including (i) South Korean initiative at national level to introduce AI-powered textbooks in primary and secondary school by 2025 to address educational inequalities and reliance on private education, and (ii) the use of AI mentors as a way to provide guidance, resources, and advice to foster employability.[14] With regard to research, Gen AI can ease the access to and processing of massive amounts of data, grant the ability to summarize content, translate materials instantaneously, and generate engaging and "gamified" learning and research experiences. Gen AI can make education more inclusive for students with various disabilities, including visual, hearing, mobility, and intellectual disabilities.[15] Among the different enabling functions related to learning inclusivity, AI tools can convert unusual speech patterns in different languages and accents into comprehensible ones, as well as enhance the capability of individuals with

tive" (PhD thesis in preparation, Luiss University). On the link between copyright and sustainability in the field of research, see C. Geiger and B. J. Jütte, "The Right to Research as Guarantor for Sustainability, Innovation and Justice in EU Copyright Law", in T. Pihlajarinne, J. Mähönen and P. Upreti (eds.), "Rethinking the Role of Intellectual Property Rights in the Post Pandemic World: An Integrated Framework of Sustainability, Innovation and Global Justice", Edward Elgar 2023, p. 138 sq.; S. B. Hirko, "Rethinking Copyright for Sustainable Human Development. Higher Education and Access to Knowledge" (Routledge 2022). More broadly, see B. J. Jütte, "What Is Sust[AI]nable Intellectual Property?", IIC 2023, Vol. 54, Issue 9, p. 1311 sq.; O. Rognstad and I. B. Ørstavik (eds), "Intellectual Property and Sustainable Markets" (Edward Elgar 2021); C. Geiger (ed), "Intellectual Property, Ethical Innovation and Sustainability", Edward Elgar, 2025 forthcoming.

[11] M. Khalifa et al., "Using Artificial Intelligence in Academic Writing and Research: An Essential Productivity Tool", Computer Methods and Programs in Biomedicine Update 2024, available at https://www.sciencedirect.com/science/article/pii/S2666990024000120. Accessed 13 February 2025.

[12] UNESCO, *AI and Education: Guidance for Policy-Makers* (UNESCO 2021). https://unesdoc.unesco.org/ark:/48223/pf0000376709?locale=en. Accessed 22 January 2025.

[13] A. Willige, "From Virtual Tutors to Accessible Textbooks: 5 Ways AI Is Transforming Education" (World Economic Forum, 10 May 2024). https://www.weforum.org/agenda/2024/05/ways-ai-can-benefit-education/. Accessed 15 January 2025.

[14] *Ibid.* (n. 13).

[15] Shalini Garg and Shipra Sharma 'Impact of Artificial Intelligence in Special Need Education to Promote Inclusive Pedagogy' (2020) 10(7) IJIET 523–527.

visual impairments by using computer vision to provide auditory feedback on the surrounding environment.

These features give the broader public access to more content by overcoming language barriers or impairments, thus helping level the playing field in both research and education.

4 Risks associated with the use of AI in research and education

The risks of using Gen AI in research and education contexts cannot be overlooked. To this end, Gen AI output does not always include references to the authors of the sources used for training, which can result in a lack of recognition, which is pivotal for researchers, loss of control by the author over the use of their works; and the impossibility of users being able to verify whether the output comes from reliable sources. It can also pose threats to scientific integrity through decontextualization and lack of or false attribution of content.[16] In this regard, examples of scholars seeing their names falsely associated with specific research output have emerged. For example, in December 2023, Prof. Diomidis Spinellis discovered that an article titled "Global Business Strategies in the Digital Age" was published under his name and primary affiliation in the *Global International Journal of Innovative Research*. He became aware of it only when a colleague brought the publication to his attention.[17] He pointed out that the publication was clearly AI-generated and could have led to reputational damage to his scientific integrity and abilities. In this respect, notwithstanding the immediate effort to remove the article online, some traces are still present. Furthermore, assume that Gen AI were instructed to generate output in a very specific area of research to which a scholar had contributed extensively and now saw his research as improperly disseminated or without his name on it, potentially causing a significant drop in citations and career progression, or his work being used to train an AI with the purpose of decontextualizing his ideas by generating content he would not want to be associated with, such as discriminatory or racist content.[18] Another possible scenario is a PhD student who relies on Gen AI for his thesis and finds that the sources are untraceable or contain inadequate scientific information, casting doubt on the credibility of his work. Similar concerns have emerged on the educational side. Indeed, in this field, the need for transparency of sources used for the training Gen AI is of utmost importance, given that information is shared with children and young adults who are still in the learning phase of their lives and thus may be (even more) negatively affected by unethical uses of Gen AI. For example, a significant risk is that AI developers share biased results, giving the impression of accuracy. In this scenario, students might not be able to critically assess the results, and hence, would build their knowledge from errors.

[16] On this issue, see A. Heidt, "Intellectual Property and Data Privacy: The Hidden Risks of AI", Nature 2024 https://www.nature.com/articles/d41586-024-02838-z. Accessed 12 December 2024. The right of integrity is also one of the main moral rights of the author; see L. Oprysk, "GenAI, Free Speech, Author's Moral Rights?", *supra*, p. 343.

[17] D. Spinellis, "False authorship: An explorative case study around an AI-generated article published under my name", Res Integr Peer Rev 10, 8 (2025), available at https://doi.org/10.1186/s41073-025-00165-z.

[18] See C. Geiger, "Elaborating a Human Rights friendly Copyright Framework for Generative AI", *supra* at p. 1136: "In fact, the weaker the fundamental rights claim to train AI is, the stronger the moral rights claim can be. For example, training an AI to produce works for discriminatory or racist purposes will benefit from a weaker (if any) fundamental rights protection, but will potentially raise important moral concerns of the author of the work used for training purposes.".

To this end, full transparency and recognizability of the authors and the origin of the output play a major role in that they would allow teachers to verify the appropriateness of the materials shared for educational purposes and, ultimately, ensure quality education. In summary, if students were provided with Gen AI materials trained with inaccurate or incomplete data, their knowledge would be biased, and they might lack diverse perspectives or reinforce historical inaccuracies.

5 Ethical and cultural challenges related to copyright and sustainability

The use of Gen AI calls for strict consideration of ethical and cultural challenges related to copyright and sustainability,[19] as enshrined in the SDG framework.[20] Copyright should promote sustainability through fair and equitable access to educational materials (in line with SDG4),[21] which in turn would be fostered by a copyright framework that allows full exploitation of the right of research.[22] In this respect, research has been defined by the non-binding UNESCO Recommendation concerning the status of Higher Education Teaching Personnel as "*original scientific, technological and engineering, medical, cultural, social and human science or educational research which implies careful, critical, disciplined inquiry, varying in technique and method according to the nature and conditions of the problems identified, directed towards the clarification and/or resolution of the problems, and when within an institutional framework, supported by an appropriate infrastructure*".[23] In legal terms, it has been submitted that the right to research can be described as a right-like entitlement[24] and a purpose-bound right,[25] as it can be characterized as an individual right that serves collective aims. Thus, the right of research can be defined as the entitlement of all relevant individuals/entities to freely obtain, process, store, and share information for research purposes in a borderless manner.[26] These "sustainability" challenges are intrinsically linked to human rights,[27] such as the need to protect authors' moral rights.[28] In particular, SDGs "seek to realize the human rights

[19] On ethical and philosophical questions concerning AI, see L. Floridi, "A Unified Framework of Ethical Principles for AI" in L. Floridi, The Ethics of Artificial Intelligence (Oxford University Press Oxford 2023), p. 57, https://academic.oup.com/book/46748/chapter/413294279. Accessed 20 March 2025. On ethical and philosophical questions concernin g AI within the field of education, see L. R. Salazar, S. F. Peeples, and Mary E Brooks, "Generative AI Ethical Considerations and Discriminatory Biases on Diverse Students Within the Classroom", in S. Elmoudden and J. S. Wrench (eds), Advances in Educational Technologies and Instructional Design (IGI Global 2024) https://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/979-8-3693-0831-8.ch010. Accessed 20 March 2025.

[20] UN General Assembly, 'Transforming Our World: The 2030 Agenda for Sustainable Development' https://digitallibrary.un.org/record/3923923. Accessed 12 January 2025.

[21] The aims of SDG4 is to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.".

[22] See C. Geiger and B. J. Jütte, "Conceptualizing a 'Right to Research' and its Implications for Copyright Law, An International and European Perspective", *supra*; C. Geiger and B. J. Jütte, "The Right to Research as Guarantor for Sustainability, Innovation and Justice in EU Copyright Law", *supra*, p. 138 sq.

[23] United Nations Educational, Scientific and Cultural Organization (UNESCO). 1997. Recommendation Concerning the Status of Higher Education Teaching Personnel.

[24] See C. Geiger and B. J. Jütte, "Copyright, the right to research and open science: About time to connect the dots" (8 June 2024). E. Bonadio & C. Sganga (eds), A Research Agenda for EU Copyright Law (Edward Elgar, forthcoming 2025), Available at SSRN: https://ssrn.com/abstract=4857765 or http://dx.doi.org/10.2139/ssrn.4857765, p. 7 sq.

[25] See C. Geiger and B. J. Jütte, "Conceptualizing a "Right to Research" and Its Implications for Copyright Law: An International and European Perspective," *supra*.

[26] *Ibid.* (no. 25), p. 62–65.

[27] UN High Commissioner for Human Rights, "Sustainable Development Goals to Human Rights Chart," (*OHCHR*) https://www.ohchr.org/sites/default/files/Documents/Issues/MDGs/Post2015/SDG_HR_Table.pdf. Accessed 9 August 2024.

[28] See UN General Assembly, "Universal Declaration of Human Rights" Art. 27 https://digitallibrary.un.org/record/666853. Accessed 11 January 2025; UN Economic and Social Council, 'International Covenant on Economic, Social and Cultural Rights.' Art. 15 https://digitallibrary.un.org/record/156096. Accessed 11 January 2025.

of all"[29] and, with specific reference to SDG4, it is anchored to the right to education as grounded in the Universal Declaration on Human Rights (UDHR) and the International Covenant on Economic, Social and Cultural Rights (ICESCR). Both the UDHR (Art. 27) and the ICESCR (Art. 15) further stress that the right to freely participate in cultural life should be balanced with the rights of authors to receive moral and material protection for their creations. The moral rights of the authors as human rights are also addressed in the European Convention on Human Rights (ECHR) in terms of the protection of personality rights (Art. 8 ECHR) and freedom of expression/right to information (Art. 10 ECHR), requiring that the information and expressions emerging from the output are correct.[30] In this respect, it can be argued that moral rights could fall within the scope of Art. 8 of the ECHR, given the close connection between personality rights and moral rights. This link has already been acknowledged in certain jurisdictions, such as Germany, where moral rights are expressly described as "authors' personality rights".[31] With reference to Article 10 of the ECHR, which enshrines the right to freedom of expression and access to information, the relationship with moral rights arises from the intrinsic connection between a creator and their work. In other words, while works protected by copyright should remain accessible to the public, they must also be duly safeguarded to respect the author's moral rights. This requires delicate balancing exercise, as discussed in this section.[32]

From a copyright perspective, the moral rights of authors provided at the international level[33] include the right of paternity ("the right to claim authorship of the work")[34] and

[29] See Preamble of the 2030 Agenda, UN General Assembly, 'Transforming Our World: The 2030 Agenda for Sustainable Development' https://digitallibrary.un.org/record/3923923. Accessed 12 January 2025.

[30] On the relationship between human rights and intellectual property, C. Geiger, ""Constitutionalizing" Intellectual Property Law? The Influence of Fundamental Rights on Intellectual Property in Europe", IIC 2006, Vol. 37(4), p. 371 sq; C. Geiger, "Implementing Intellectual Property Provisions in Human Rights Instruments: Towards a New Social Contract for the Protection of Intangibles", in C. Geiger (ed.), "Research Handbook on Human Rights and Intellectual Property", Edward Elgar, 2015, p. 661 sq.; C. Geiger and E. Izyumenko, "Intellectual property before the European Court of Human Rights", in C. Geiger, C.A. Nard and X. Seuba (eds.), Intellectual Property and the Judiciary (EIPIN series Vol. 4, Edward Elgar Publishing, 2018); C. Geiger and E. Izyumenko, "Copyright on the Human Rights' Trial: Redefining the Boundaries of Exclusivity through Freedom of Expression", IIC 2014, Vol. 45, Issue 3, p. 316. With respect to moral rights in particular, see C. Geiger and E. Izyumenko, "Designing a freedom of expression-compliant framework for moral rights in the EU: challenges and proposals", in Y. Gendreau (ed.), Research Handbook on Intellectual Property and Moral Rights, Edward Elgar, 2023, p. 292–314.
Vol. 37(4), p. 371 sq; C. Geiger, "Implementing Intellectual Property Provisions in Human Rights Instruments: Towards a New Social Contract for the Protection of Intangibles", in C. Geiger (ed.), "Research Handbook on Human Rights and Intellectual Property", Edward Elgar, 2015, p. 661 sq.; C. Geiger and E. Izyumenko, "Intellectual property before the European Court of Human Rights", in C. Geiger, C.A. Nard and X. Seuba (eds.), Intellectual Property and the Judiciary (EIPIN series Vol. 4, Edward Elgar Publishing, 2018); C. Geiger and E. Izyumenko, "Copyright on the Human Rights' Trial: Redefining the Boundaries of Exclusivity through Freedom of Expression", IIC 2014, Vol. 45, Issue 3, p. 316. With respect to moral rights in particular, see C. Geiger and E. Izyumenko, "Designing a freedom of expression-compliant framework for moral rights in the EU: challenges and proposals", in Y. Gendreau (ed.), Research Handbook on Intellectual Property and Moral Rights, Edward Elgar, 2023, p. 292–314.

[31] C. Geiger and E. Izyumenko, "Intellectual Property before the European Court of Human Rights", *supra*.

[32] C. Geiger and E. Izyumenko, "Designing a freedom of expression-compliant framework for moral rights in the EU: Challenges and proposals", *supra*.

[33] Moral rights are not harmonized in the EU. In this respect, see *Ibid.* (no. 32). However, most EU Member States have well-developed moral rights protection included in their national copyright law. The non-harmonization of moral rights in the EU has been traditionally justified by the lack of competence to do so. However, this was prior the introduction of Art. 118 of the TFE,U which allows the establishment of "measures for the creation of European intellectual property rights to provide uniform protection of intellectual property rights throughout the Union." It is time to revive the issue from the perspective of creating an EU copyright law securing both moral and material interests of creators, in line with international human rights treaties. See C. Geiger, "Building an ethical framework for intellectual property in the EU: Time to revise the Charter of Fundamental Rights", in G. Ghidini and V. Falce (eds.), "Reforming Intellectual Property Law", Edward Elgar, 2022, 77.

[34] Article 6bis(1) of the Berne Convention for the Protection of Literary and Artistic Works (9 September 1886, 828 UNTS 221) (as amended on 28 September 1979), available at: https://wipolex.wipo.int/en/text/283693.

the right of integrity (meaning the right to "object to any distortion, mutilation or other modification of, or other derogatory action in relation to, the said work, which would be prejudicial to his honor or reputation").[35] These rights may be deeply affected by the risks related to the use of Gen AI mentioned above, in that Gen AI outputs might not disclose the authors of the copyrighted materials used for the training, may decontextualize sources while making summaries that do not represent the authors' perspective, and may produce wrong quotations or footnotes and/or omit them altogether.

Gen AI can be a good facilitator for educational and research purposes, enabling the creation of a level playing field when it comes to accessibility of materials from students and researchers globally (in line with SDG10).[36] This is on the condition that precautionary measures granting transparency are in place, such that the sources used for the training are clearly displayed, ultimately making researchers' interests part of the regulatory equation. This approach is consistent with the EU regulatory framework for AI,[37] in which transparency is arguably one of its most important pillars. Another pillar at the core of the ethical/sustainable use of Gen AI is that it—and by extension the associated copyright regime—should be "human-rights friendly",[38] which requires that the human author is the cornerstone of any technical/regulatory regime around Gen AI. This mandates copyright provisions that protect the author's moral rights when copyrighted materials are used for training to generate output.

Consistent with the abovementioned considerations concerning education and research, two important sets of guidelines have been issued relating to the use of Gen AI. The first is the "Living Guidelines on the Responsible Use of Generative AI in Research[39] of the European Commission".[40] These guidelines were prepared with the aim of addressing the risks of large-scale disinformation and other unethical uses within the research field, a sector that may benefit greatly from Gen AI but that, if not used with care, could be disrupted by significant risks. The main pillars of these guidelines are as follows:

- *Reliability* The results generated by Gen AI systems should be verified, and attention should be paid to potential equality and non-discrimination issues concerning biases and inaccuracies.
- *Honesty* Research should be carried out with transparency and the use of Gen AI should be disclosed.

[35] *Ibid.* (no. 34). For moral rights issues raised by machine learning processes, see J. Drexl et al. (2019), "Technical aspects of artificial intelligence: An understanding from an intellectual property law perspective", Max Planck Institute for Innovation and Competition Research Paper No. 19-13, p. 12, stating in particular that "the right to integrity can pose limitations to the training and to the creation of outputs by AI, namely, regarding the processing of protected works".

[36] The aims of SDG10 is to "reduce inequality within and among countries.".

[37] Council Regulation (EC) 2024/1689 of 13 June 2024 laying down harmonized rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act) [2024] OJ L1689/1.

[38] On the elaboration of a human friendly copyright framework for Generative AI, see C. Geiger, "Elaborating a Human Rights Friendly Copyright Framework for Generative AI", *supra*.

[39] These guidelines are part of a broader EU framework and complement and build on the EU AI policy, including the EU Artificial Intelligence Act.

[40] European Commission, 'Living Guidelines on the Responsible Use of Generative AI in Research Published' (European Research Area Platform, March 2024) https://european-research-area.ec.europa.eu/news/living-guidelines-responsible-use-generative-ai-research-published accessed 20 January 2025.

- *Respect* Researchers should consider the limitations of technology, its environmental impact, and its societal effects, which imply respect for intellectual property and privacy rights, and the correct management of information and citations.
- *Accountability* Output should be the result of human actions and oversight.[41]

Although these guidelines generally refer to compliance with intellectual property rights, they do not address the detailed implications regarding copyright. However, a sustainable copyright framework would be crucial with regard to output and publications carried out with the support of Gen AI, from the perspective of authors' moral rights as well as the accessibility of materials.

The other relevant instrument is the "Guidance for generative AI in education and research" issued by UNESCO,[42] which aims to support regulations, policies, and human capacity development programs to ensure that Gen AI benefits and empowers learners, teachers, and researchers. The main observation arising from analysis of this guidance is that for the use of AI to be trustworthy, it requires collaboration with humans. This aligns with the four pillars of the guidelines as well as international human rights treaties mentioning the moral and material interests of creators for a *human-centric approach*.

6 Sustainability as a guiding principle for copyright reform in the regulation of generative AI

Based on the abovementioned considerations, the policy proposal for a sustainable copyright regime for Gen AI should include transparency provisions with respect to the copyrighted materials used for training, which also allows for the identification of the works used in the process and thus ensures the protection of the moral rights of the authors when outputs are generated. Additionally, it is essential that the "human-centric" approach concerning the use of AI allows authors whose copyrighted materials are used for the training to then generate outputs to check that their works are not falsely attributed, decontextualized, and/or misinterpreted.

The combination of these two requirements highlights the imperative to properly address the need to balance the accessibility of Gen AI output with moral rights provisions, ensuring that the promotion of innovation is not compromised. In this realm, the legislator should reflect on a legal framework that would secure moral rights in the context of Gen AI, particularly regarding the attribution and integrity of Gen AI output used in research and education. Meanwhile, the proposed solutions should be technically feasible: any suggested legal reforms should align with a system that promotes the ethical deployment of Gen AI while enabling society to benefit from its recognized transformative potential in research and education. Therefore, normative provisions generating uncertainty or inhibiting the use of this technology are not recommended. While it may be argued that moral rights can introduce further rigidity and thus, are not perfectly suited to the dynamic and distributed nature of AI systems, we contend that a balanced approach anchored in transparency and effective redress mechanisms offers an appropriate solution.

A way forward could be a mechanism that allows creators whose works are falsely attributed or manipulated in the case of moral rights violations to notify the violation

[41] *Ibid.* (n 40).

[42] UNESCO, 'Guidance for Generative AI in Education and Research' (UNESCO, 7 September 2023) https://www.unesco.org/en/articles/guidance-generative-ai-education-and-research accessed 18 February 2025.

of a regulation authority, which would have the power to assess the situation, ask the AI provider for further information if necessary or liaise with national AI authorities,[43] and require compliance measures in the case of established violations of paternity and integrity rights.[44] For efficiency, these complaint mechanisms should be easy and fast to apply for users, such as through an online portal set up by a regulator.[45] One of these measures of ultimate resort could be to order that the work should be removed from Gen AI training datasets (similar in effect to an "opt out",[46] except that it would not be for the author to express the opt out but for the authority to request it from the AI provider).[47] In any case, authors should be allowed to challenge potential violations of their moral rights. In this vein, the AI Office recently established by the EU AI Act as an AI regulator[48] (or another independent EU body to be established for monitoring purposes), could serve as a complaint authority in the case of moral rights violations and be entrusted with quasi-judicial powers to address the issue with AI developers through fundamental rights-compliance mechanisms. In this regard, the AI Office has already worked on a code of practice, which addresses transparency obligations and copyright-related rules.[49] However, even if transparency is one of the pillars of a sustainable copyright framework for Gen AI when it comes to the training of AI models at the input stage, this article argues that the moral rights of authors at the output stage must also be part of the equation.

[43] This in case there are unclear aspects with regard to the national moral right legal framework in place, as moral rights are not harmonized in the EU and therefore, there is no EU moral rights regime.

[44] Advocating a stronger role for regulators in the field of Generative AI and copyright, see C. Geiger and V. Iaia, "Towards an Independent EU Regulator for Copyright Issues of Generative AI: What Role for the AI Office (But More Importantly: What's Next)?", Auteurs & Media 2024/2, p. 185, and more generally in the digital environment, C. Geiger and N. Mangal, "Regulating Creativity Online: Proposal for an EU Copyright Institution", GRUR International 2022, Vol. 71, Issue 10, p. 933 sq.; C. Geiger and B. J. Jütte, "Digital Constitutionalism and Copyright: Towards a New Social Contract for the Regulation of Creativity in the Digital Environment", in O. Pollicino, G. de Gregorio and P. Valcke (eds.), "Oxford Handbook of Digital Constitutionalism", Oxford University Press, 2025 (forthcoming).

[45] In the same spirit, Art 17(9) of the Copyright in the Digital Single Market Directive (CDSM) foresees that "*Member States shall provide that online content-sharing service providers put in place an effective and expeditious complaint and redress mechanism that is available to users of their services in the event of disputes over the disabling of access to, or the removal of, works or other subject matter uploaded by them.*" Another possible way forward could be to implement at the regulator's level an out-of-court dispute settlement mechanism in the spirit of Art. 21 of the Digital Services Act (DSA) to secure users' rights. In the same vein, Art. 17(9) of the CDSM also foresees an out-of-court redress mechanism to allow users to assert the use of an exception or limitation to copyright and related rights (i.e., the mechanism allows balancing the conflict between filtering activities to be undertaken by online content-sharing service providers and the possibility of users having verified the applicability of an exception or limitation). In the case at stake, the same mechanism could be used to secure the moral rights of authors, who would be allowed to resort to out-of-court settlement mechanisms to protect their rights in a quick, cost-effective, and reliable manner.

[46] See F. Pasquale and H. Sun, "Consent and Compensation: Resolving Generative AI's Copyright Crisis", Virginia Law Review Online 2024, Vol. 110, p. 207 sq., who have argued that there should be a right to opt out when moral right infringement is established and to ask for the removal of the work from the training dataset.

[47] AI models can erase specific data from their training set, thus "unlearning" it. See B. Lorica, "The Art of Forgetting: Demystifying Unlearning in AI Models", May 2024, https://gradientflow.com/unlearning-unpacked/.

[48] On its competences, see C. Geiger and V. Iaia, "Towards an Independent EU Regulator for Copyright Issues of Generative AI: What Role for the AI Office (But More Importantly: What's Next)?", *supra*. However, for now, it seems that the AI office was tasked only with limited regulatory competences in the field of copyright, confined to the few provisions on copyright in the AI Act (https://digital-strategy.ec.europa.eu/en/policies/ai-office). This leaves open a much -needed reflection on the proper regulatory institutional framework essential to secure an ethical and sustainable use of AI in the future. The current governance structure set up by the AI Act (Chapter VII) seems very complex and too much dependent on the coordination of national regulators to be satisfying for the achievement of a truly integrated digital single market (see C. Geiger and N. Mangal, "Regulating Creativity Online: Proposal for an EU Copyright Institution", *supra*). Nevertheless, because moral rights are not yet harmonized in the EU, the AI office could collaborate closely with national AI regulators when determining the infringement and securing relief.

[49] See the Final Draft of the General-Purpose AI Code of Practice, Commitments by Providers of General Purpose AI models, Copyright Section, https://digital-strategy.ec.europa.eu/en/policies/contents-code-gpai. With reference to the ongoing discussion on AI regulation authorities, see C. Novelli, P. Hacker, J. Morley, J. Trondal, L. Floridi, "A Robust Governance for the AI Act: AI Office, AI Board, Scientific Panel and National Authorities", European Journal of Risk Regulation 2024, p. 1–25, available at https://doi.org/10.1017/err.2024.57.

Thus, the AI governance structure in the EU should foresee a mechanism to secure the compliance of AI outputs with the moral rights of authors.

7 Conclusion

The analysis shows that an ethical copyright framework for Gen AI requires balancing various interests, considering sustainability and human rights, while simultaneously incentivizing progress and AI innovation.[50] This article offers proposals in this regard. In particular, it considers whether the principle of sustainable development and the SDGs provide proper guidelines for copyright reforms to address the challenges of using Gen AI in the field of research and education. Copyright provisions regulating Gen AI should allow exploitation of its transformative power to foster access to materials for education and research purposes. However, copyright provisions regulating Gen AI should be informed by two pillars: transparency and a "human-centric" approach. To achieve these goals, compliance with the moral rights of the author must be secured in the context of the Gen AI copyright framework. This article argues that a regulatory monitoring system for Gen AI outputs based on fundamental rights compliance mechanisms may be an effective and promising way forward.

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[50] C. Geiger, "Elaborating a Human Rights Friendly Copyright Framework for Generative AI", *supra*, p. 1129 sq.