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An Investigation into the Dual Impact of Generative AI on Academia

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Abstract— *Generative artificial intelligence (GenAI) tools such as ChatGPT, Google Gemini, Deepseek, and Microsoft Co-Pilot have become rapidly integrated into academia. They enhance productivity by aiding in text generation, content refinement, research assistance, and language processing. On the contrary, their widespread use is introducing ethical dilemmas such as plagiarism risks, content authenticity issues, and critical thinking erosion. This study investigates the dual impact of GenAI on academia by conducting a systematic literature review of peer-reviewed articles published between 2019 and 2025. The review identifies key benefits, including improved efficiency, personalized learning, and support for educators and researchers, alongside risks that threaten academic and research integrity. It highlights the importance of transparency, ethical governance, and institutional responses such as AI literacy programs, disclosure requirements, and policy frameworks. The findings underscore that while GenAI can strengthen teaching, learning, and research, its responsible integration requires ethical guardrails to safeguard fairness, accountability, and scholarly trust.*

Keywords— *Academic integrity, research integrity, generative AI, artificial intelligence, plagiarism, AI ethics.*

I. Introduction

Generative Artificial Intelligence (GenAI) has risen to prominence, reshaping fields such as creative work, computer vision, and natural language processing. Generative AI's history begins in the late 1950s with Rosenblatt's Perceptron, followed by Weizenbaum's ELIZA in the 1960s and the Dragon voice recognition system in the 1980s [1]. After a slowdown, the 2000s saw renewed interest with the growth of the internet and neural networks [1]. From 2010 onward, advancements in deep learning and multi-layered neural networks allowed artificial intelligence (AI) to train itself on large datasets, leading to the development of powerful generative models such as such as Generative Adversarial Networks (GANs) [1], [2]. Generative Adversarial Networks enabled the creation of highly realistic images, text, and speech through the interplay of generator and discriminator networks. Alongside GANs, Variational Autoencoders (VAEs) provided a probabilistic approach to generating diverse samples, and autoregressive models excelled at producing sequences such as text, speech, and music. Advances in natural language processing (NLP), including transformer architectures and contextual embeddings like Bidirectional Encoder Representations from Transformers (BERT) and Generative Pre-trained Transformer (GPT), further enhanced AI's ability to understand and produce human-like language, paving the way for today's large-scale generative applications such as ChatGPT, Google Gemini, and Microsoft Copilot.

The rapid evolution of GenAI has marked a profound shift in how knowledge is created, processed, and communicated within academia. Its usage has expanded rapidly, becoming increasingly visible among students, educators, and researchers [3]. The accessibility of tools such as ChatGPT has contributed to their widespread adoption, making them common features in academic practice [3]. As observed in [4], AI technologies are now embedded across diverse domains of academic work, influencing how ideas are developed, research is designed, and scholarly outputs are produced and disseminated. However, this integration is not without complications. Alongside new opportunities, the rapid spread of GenAI has generated concerns over its impact on academic values, integrity, and the authenticity of scholarly work [4].

II. Purpose of the Study

The purpose of this study is to investigate the dual impact of GenAI tools on academia by exploring both their positive contributions and the ethical risks associated with their use. Specifically, the review focuses on identifying trends, benefits, risks, and ethical considerations arising from GenAI integration in teaching, learning, assessment, and research, thereby contributing to the broader discourse on responsible and sustainable AI use in higher education and research.

This paper is organised as follows: Section 2 outlines the methodology of the review process; Section 3 presents the positive impact of GenAI usage in academia; Section 4 presents the risks of GenAI usage on academia; Section 5 highlights some key institutional, regulatory and ethical recommendations for responsible AI integration in academia; and the investigation concludes in Section 6 along with future direction

III. Methodology

This study adopted a systematic narrative literature review design to comprehensively examine the multifaceted impact of generative AI in academia, focusing on both its benefits and ethical challenges. The review process involved a structured approach to identifying, selecting, and synthesising relevant scholarly works published between 2019 and 2025 (approximately last 5 years). Such an approach provides a rigorous, transparent synthesis of diverse interdisciplinary sources, ensuring coverage of the most recent developments and debates [5].

The literature search was conducted using Google Scholar as the primary search platform for scholarly publications. Google Scholar presents a comprehensive output from a wide range of publishers including content from key indexing databases such as Scopus, Web of Science, Institute of Electrical and

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Electronics Engineers (IEEE) Xplore, and Association of Computer Machinery (ACM). A combination of targeted keywords was used, including terms such as "generative AI in academia," "AI and academic integrity," "AI and research integrity," "ethical use of AI in education," and "ChatGPT academic writing." In addition, Boolean operators (e.g., AND, OR) were applied to refine the search results.

The inclusion criteria required articles to be: (i) peer-reviewed; (ii) published in English between 2019 and 2025; and (iii) focused on the use of generative AI tools in academic and research contexts, particularly addressing either benefits, risks or ethical considerations. Exclusion criteria discarded non-peer-reviewed materials, opinion pieces without empirical or theoretical grounding, articles outside the field of academic and research context and works focusing solely on technical AI model development without discussing educational applications or implications.

Eligible articles were systematically reviewed and categorized into the following topics – (a) positive impact of GenAI usage in academia; (b) risks with GenAI usage in Academia; (c) institutional, regulatory, and ethical recommendations for responsible AI Integration in academia; and (d) Conclusion and future research directions.

IV. Positive Impact of GenAI Usage in Academia

Generative AI has gained rapid acceptance amongst students, educators and researchers by offering new possibilities for learning, teaching, and discovery, and therefore becoming an integral part of academic practice. The section presents key studies that highlight the different academic domains that are positively impacted by use of GenAI by students, educators and researchers.

A. Positive Impact Amongst Students

Amongst students, GenAI is used for a variety of academic purposes. A review of 38 studies by [6] reported that GenAI supports personalized learning, provides adaptive feedback, and strengthens metacognitive processes, helping learners take greater control of their studies. It also fosters critical thinking by prompting reflection, encouraging multiple perspectives, and improving problem-solving skills. Research by [7] reported that students turn to ChatGPT and Gemini to enhance learning through personalized tutoring, interactive practice problems, and adaptive feedback. Further in [8], it is highlighted that use of ChatGPT and Gemini in completing assignments and even preparing for standardized examinations, raising concerns about academic integrity. Similarly, the work of [9] shows through meta-analysis that GenAI can boost academic achievement, motivation, and self-efficacy when applied to study tasks. Research in [10] provides empirical evidence that students use GenAI tools for essay writing and study preparation, though with mixed impacts on performance. The role of GenAI in improving grammar, structure, and clarity, making it particularly valuable for non-native English speakers is also emphasized in [4]. Researchers in [11] also confirm this rapid uptake, noting that ChatGPT has been widely adopted by students for interactive learning, personalized support, and formative assessments.

B. Positive Impact Amongst Educators

For educators, GenAI serves as a powerful support system in teaching and assessment. It is pointed out in [11] that educators are increasingly engaging with ChatGPT as an instructional aid. Teachers employ tools such as ChatGPT and Gemini to design course content, create personalized learning materials, and provide adaptive feedback to students [7]. In [12], the authors emphasize the integration of AI into curriculum development and assessment design, where it assists in generating practice problems and reshaping pedagogy. Work in [13] highlights that educators are experimenting with AI-driven authentic assessments, aiming to reduce plagiarism risks while maintaining fairness and integrity in evaluation.

C. Positive Impact Amongst Researchers

Within the research community, GenAI is now embedded throughout the research lifecycle. Scholars use GenAI tools for ideation, literature reviews, and drafting manuscripts, significantly accelerating early stages of research [14]. Work of [3] provides bibliometric evidence of the sharp rise in GenAI publications across disciplines, underscoring its diffusion beyond computer science into the broader scientific ecosystem. Specific applications such as literature synthesis, editing, and managing references, which improve clarity and productivity in scholarly writing are identified in [4]. Adding, AI's role in optimizing data analysis and discovery is further stressed in [15].

While research shows the transformative potential of GenAI across academia, its rapid uptake by students, educators, and researchers also raises concerns with regards to academic integrity. The next section presents the risks associated with the use generative AI in academia.

V. Risks with GenAI Usage in Academia

The integration of GenAI into academia has amplified the risks around plagiarism, authorship, and fairness, while also introduced new risks such as data privacy breaches, bias, and reproducibility of knowledge. This section presents such key studies that stress these domains of academic integrity that are at risk due to the unregulated rapid uptake of GenAI in academia.

A. Risks Amongst Students

Amongst students, GenAI introduces substantial risks to the authenticity of student learning and assessment. Excessive dependence on AI tools can reduce students' independence, hindering their ability to think critically and solve problems without technological aid [6]. In addition, it is noted in [16] that the use of AI to complete assignments or assessments without their genuine understanding undermines the authenticity of student work and leads to unfair evaluation. Evidence from [8] shows that students increasingly use AI to generate essays, complete homework, and even pass standardized exams, heightening the prevalence of plagiarism, making detection more difficult, and leading to diminished creativity and learning ability. Plagiarism and contract cheating - where students outsource assignments or rely on AI to produce undetectable work – are recognized as pressing issues which threaten the

credibility of academic work and weaken the trust in higher education systems in [17]. In [18], it is cautioned that over-reliance on tools such as ChatGPT erodes critical thinking and problem-solving skills, while fostering impatience, anxiety, and low confidence in academic tasks. It is observed in [13] that students may rationalize dishonesty by weighing the efficiency of AI against potential risks, thereby undermining expected academic standards. Collectively, these findings highlight that while GeneAI offers convenience, its misuse among students poses significant threats to authenticity, originality, and long-term learning outcomes, underscoring the urgent need for integrity education, robust detection tools, and supportive academic policies.

B. Risks Amongst Educators

For educators, the rapid integration of GenAI introduces complex risks in teaching, assessment and pedagogy. Plagiarism, data fabrication, and ambiguous authorship are becoming pervasive issues that threaten the credibility of academic work and weaken the collaborative trust in academic community [19]. In [13], it is highlighted how GenAI can generate seemingly authentic assessments, making it difficult for educators to distinguish student work from machine outputs and thereby undermining the value of higher education degrees. These concerns are further highlighted in [17], and further noting plagiarism risks, erosion of critical thinking, and the danger of AI outputs being mistaken for authentic student work. Adding further, [11] emphasize that while ChatGPT offers benefits, many educators are concerned about inaccuracies, bias, and privacy risks that compromise its instructional value. Similarly, [7] highlight a shift of integrity concerns onto educators, as students can misuse GenAI to resolve assignments, quizzes and submit AI-generated solutions as their own work. Therefore, according to [7], educators must redesign assessments, police academic dishonesty, and manage institutional accountability while still trying to use AI constructively. Collectively, findings show that GenAI threatens an educators' ability to maintain fairness in assessment, protect integrity in learning, and uphold trust in academic standards.

C. Risks Amongst Researchers

Within research, GenAI presents profound risks to integrity, reproducibility, and credibility. It is warned that AI-generated content lacks transparency and traceability, potentially worsening the reproducibility crisis [12]. The authors also note the rise of AI-powered manuscript factories - services that mass-produce fraudulent articles – that threaten the reliability of scholarly publishing. Algorithmic bias as a pressing concern to research integrity is raised in [15] where AI systems trained on skewed or incomplete datasets can lead to distorted scientific conclusions. The authors further emphasize that tools like ChatGPT may also produce fake or copied content, and because AI systems are often not transparent, it is hard to detect mistakes or hold anyone accountable. It is cautioned in [14] that while AI aids research productivity, over-reliance risks undermining originality and scholarly judgment. AI can generate convincing but fabricated content and citations, increasing the danger of academic dishonesty if not verified [4]. The study of [20] reports that AI-generated abstracts and manuscripts are often indistinguishable from authentic ones, complicating peer review and raising the risk of false scholarship entering the academic records. Further issues such as exclusion of recent literature, limited contextual understanding, and the erosion of creativity when researchers depend heavily on AI are highlighted in [21]. Finally, [3] emphasize that although AI accelerates publication outputs, its rapid adoption raises unresolved questions around intellectual property, confidentiality, and ethical use. Collectively, the studies presented in this section highlight risks that challenge the principles of honesty, accountability, and transparency, thus emphasizing the urgent need for strong governance and verification practices in research.

From the evidence of risks of GenAI usage amongst students, educators and researchers, presented in this section, it is clear that the misuse of GenAI raises deeper ethical concerns that academia cannot ignore. It can be concluded from the studies that the misuse of GenAI threatens the core academic values such as fairness, authenticity, accountability, and transparency. The next section presents institutional and publisher-level responses, international and professional guidelines, and emerging ethical frameworks, that could be considered before implementing GenAI in higher education.

VI. Institutional, Regulatory, and Ethical Recommendations for Responsible AI Integration in Academia

The rapid integration of GenAI in academia has pushed higher education institutions (HEIs), publishers (academic), and global organizations (other than HEIs and academic publishers) to focus on integrating AI into education, to design policies in order to balance innovation with academic integrity. The next section presents studies that show recommendations by HEIs and publishers towards responsible AI integration in academia.

A. Recommendations by HEIs and Publishers

Universities worldwide are revising their academic integrity policies in response to GenAI. The study by [22] found that major United States (US) universities have, instead of completely banning tools like ChatGPT, adopted a cautious and flexible approach, often leaving decisions to individual instructors. The study further highlighted that many universities now provide resources such as syllabus templates, workshops, and staff consultations to support responsible GenAI use. An in-depth study by [23] reviewed the institutional and regulatory responses to GenAI in academic research, showing that higher education institutions (HEIs) and publishers are actively reshaping their integrity policies. Shown in Table 1 below is a list of prominent institutions/publishers and their responses and/or recommendations towards use of GenAI in academia adapted from [23]:

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TABLE I. Responses and recommendations from publishers and HEIs towards use of GenAI in academia

Institution/Publisher	Response and/or Recommendations
Committee on Publication Ethics (COPE)	AI cannot be authors; disclosure required in methods/acknowledgments; human authors remain responsible.
Cambridge University Press (CUP)	Follows AI research ethics policy developed by University of Cambridge; advocates transparent AI use required; prohibits AI authorship; authors accountable for accuracy and originality.
Nature journals (include Springer, Biomed Central (BMC), Palgrave Macmillan)	No AI authors or AI-generated images; disclosure in "Methods"; warns against AI in peer review; peer review must remain human-led.
Institute of Electrical and Electronics Engineers (IEEE), American Psychological Association (APA), Modern Language Association (MLA), Chicago Manual of Style Online (Chicago)	Have updated their guidelines with citation styles to cite AI tools in the 'Acknowledgements' section. IEEE is flexible with AI use for grammar assistance, however, insists of disclosure in acknowledgments.
SAGE Publishing	Allows disclosure in acknowledgments or methods; warns of hallucinations, biases, and misinterpretations; prohibits AI as authors.
Taylor & Francis Group	Stresses that originality, validity, and integrity are uniquely human responsibilities; requires disclosure of AI use.
John Wiley & Sons (Wiley)	Follows COPE; AI use must be disclosed in acknowledgments; innovation allowed only with transparency.
American Association for the Advancement of Science (AAAS)	Informed by ICMJE; prohibits AI-generated text/images unless approved by editor; requires disclosure in cover letter and manuscript.
Elsevier	Restricts AI to readability improvements; prohibits authorship and AI-altered images unless AI use itself is the subject of research.
Massachusetts Institute of Technology (MIT)	Discourages usage GenAI tools that MIT has not subscribed to; recommends only institution-approved platforms; also hints at citing or acknowledging the usage of AI tools, as it shares the links for citing the GenAI tools as per different citation styles such as Chicago, MLA, APA, etc.
University of Cambridge	Adopts Russell Group principles: promotes AI literacy, ethical integration in teaching and research; emphasizes privacy, fairness, and responsible use.
Harvard University	Permits experimentation under strict data privacy and compliance rules; all AI access goes through Harvard IT; guidance extends to text, images, code, and productivity use.
University of Pennsylvania	Faculty set rules: some prohibit AI entirely, others allow limited uses (brainstorming, proofreading); students must follow department-level policies.
University of Sydney	Prefers advanced models (GPT-4, Claude 3); has detailed "AI in Education" portal; unauthorized AI in assessments is academic misconduct; guardrails on privacy, accuracy, acknowledgment.
Maastricht University	Issues role-specific guidelines (program directors, staff, students); promotes digital literacy and problem-based learning; student work without AI use may be treated as an integrity benchmark.
Universiti Malaya	Provides brochures guiding ethical AI use; informs lecturers of "anti-AI" detection tools (GPTZero, Originality.AI, GLTR).
City University of Hong Kong	Offers CityU GPT service via Microsoft Azure; secure and confidential; quotas on usage; emphasizes privacy and responsible use.
Uppsala University	Encourages quality of learning over shortcuts; promotes transparent, responsible AI use; provides explanations of how GenAI works for students/staff.
University of Toronto	Integrates Microsoft Copilot into classrooms; allows student opt-outs; has an AI Task Force and a Provostial Advisor on AI for strategy.

While universities and publishers are shaping immediate policies, the broader academic ecosystem also depends on international and professional guidelines that provide a common ethical foundation for AI integration. The next section presents frameworks by international organizations to ensure AI use in academia aligns with ethical and humanistic values.

V. Recommendations by International Organizations

The United Nations Educational, Scientific and Cultural Organization (UNESCO), through its International Forum on AI and Education [24], stressed that AI should be regarded as a common good and integrated into education in ways that uphold humanistic values. The UNESCO developed the AI Competency Framework for Students (AI CFS) that provides a structured approach to equip learners with the knowledge, skills, and values needed to engage with AI responsibly [25] four key areas: fostering a human-centred mindset to understand AI's role in society and sustainable development; cultivating awareness of the ethics of AI, including fairness, accountability, and transparency; developing practical knowledge of AI techniques and applications to use tools effectively; and advancing AI system design skills to scope problems, train, and optimize solutions. These competencies are organized into twelve blocks that progress across three levels—understand, apply, and create—ensuring learners move from basic literacy to critical use and co-creation. The framework is designed to be adaptable, Gen-AI tool-neutral, and future-proof against AI development, encouraging students not only to become skilled users of AI but also responsible citizens capable of addressing ethical dilemmas and leveraging AI for human and social good.

The European University Association (EUA) [26] recommends that universities adopt a proactive and transparent approach to the use of AI in learning and teaching. Institutions should create spaces for dialogue among staff and students to

address the ethical, legal, and pedagogical implications of AI, including questions of fairness, copyright, and data security. Policies must be regularly updated to move beyond broad statements and provide practical guidance for daily teaching and assessment practices. In particular, assessment models should be revised to emphasize authenticity and formative feedback, reducing opportunities for inappropriate reliance on AI tools. The EUA further highlights the importance of aligning AI use with institutional missions, legal frameworks, and core values such as academic integrity and inclusion. Finally, universities are encouraged to engage with the broader societal debate on AI by researching its cultural and labour market impacts and preparing graduates with the skills and literacy to navigate an AI-mediated world.

The United States (US) Department of Education [27] produced a report with recommendations for integrating AI into academia. Central to these recommendations is the view that AI should complement, not replace, educators, with human oversight remaining essential in decision-making and feedback. The report emphasizes that adoption must be guided by clear learning goals, evidence-based teaching practices, and equity objectives, rather than being driven by technological trends alone. It encourages the use of AI systems that build on student strengths, foster collaborative and creative learning, and provide tailored support for students with disabilities and multilingual learners. To establish trust, institutions are urged to ensure transparency, fairness, and evidence of effectiveness in AI applications. The report further highlights the importance of engaging teachers in the design, evaluation, and selection of AI tools, supported by professional development that enhances AI literacy. Policymakers are advised to create new safeguards addressing risks such as bias, privacy breaches, and accountability gaps, while research and development efforts should focus on models adapted to diverse cultural, institutional, and learner contexts, tested in authentic educational environments rather than limited laboratory conditions.

The Huron Consulting Group (HCG) [28] has outlined seven guiding principles designed to help colleges and universities adopt AI in an ethical, trustworthy, and effective manner. First, AI should be designed to augment human decision-making and uphold human dignity, ensuring that faculty and researchers retain authority even when AI tools assist with grading, research, or administrative tasks. Institutions are urged to implement strong safeguards and security protocols to minimize risks and build trust in AI deployment. Reliability is emphasized through regular auditing of AI-generated outputs, with mechanisms such as fact-checking and updates to ensure accuracy in tools like student advisory chatbots. Transparency is equally critical, requiring that AI systems be explainable so users can understand how outputs are generated, avoiding opaque “black box” processes. Clear accountability structures must also be established, defining roles and responsibilities for AI use in areas such as grading, admissions, and research oversight. In addition, institutions must actively check for bias to prevent unfair outcomes, particularly for underrepresented student groups, and safeguard sensitive data such as student records, health information, and intellectual property to prevent misuse. Together, these principles provide a practical framework for universities to integrate AI responsibly while preserving academic integrity and public trust.

The responses of HEIs, publishers, and the prominent international organizations such as UNESCO, US DoE, EUA, and HCG show that GenAI must be managed through structured policies, training, and transparent disclosure practices. The measures demonstrate progress in protecting academic and research integrity as well as highlight the ongoing tensions between innovation, ethics, and institutional capacity. The diversity of approaches suggests that the responses are still in an experimental phase, where clear standards are evolving across contexts. This creates opportunities for further discussions on the broader implications of generative AI in higher education and research, including how institutions, educators, and publishers can collaboratively balance the risks to integrity and scholarly trust.

V. Conclusion and Future Work

This study has investigated the dual impact of GenAI on academic and research integrity, highlighting its benefits and risks and the growing institutional responses. Through a systematic literature review, the analysis has shown that GenAI tools can enhance academic productivity and collaboration, support personalized learning, and streamline research processes. At the same time, these tools introduce complex risks related to plagiarism, authorship ambiguity, algorithmic bias, and the erosion of critical thinking, all of which threaten the core values of honesty, accountability, and transparency in academia.

At the student level, GenAI supports personalized learning and engagement, yet its misuse can undermine authentic assessment and skill development. For educators and researchers, GenAI offers powerful tools for writing, analysis, and collaboration, but it also raises concerns about reliability, plagiarism, and over-reliance. Institutional responses have therefore become critical, with universities and publishers revising guidelines, promoting AI literacy, and developing frameworks for responsible use.

Although this review offers valuable perspectives, it is limited by its reliance on secondary literature. More empirical research is needed to understand long-term cognitive, ethical, and pedagogical impacts of GenAI across different disciplines and regions. Future work will focus on developing discipline-specific AI literacy programs, refining academic integrity policies, and exploring how GenAI can support—not replace—human judgment and creativity.

Ultimately, the responsible and sustainable use of GenAI in higher education requires a proactive, interdisciplinary approach, one that combines ethical governance, stakeholder collaboration, and continuous evaluation. By embracing innovation while safeguarding fairness, accountability, and transparency, higher education institutions can ensure that GenAI strengthens, rather than compromises, the values of teaching, learning, and research

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