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Article

The Ethical Landscape of Generative AI: A Multi-Level Analysis of ChatGPT

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Abstract: The advent of generative artificial intelligence, particularly large language models like ChatGPT, represents a paradigm shift in human-computer interaction, offering transformative potential across numerous sectors. However, this rapid advancement has precipitated complex and urgent ethical debates, which often remain fragmented and disproportionately focused on risks, lacking a systematic analysis that equally considers ethical opportunities and holistic governance. This paper aims to address this gap by conducting a systematic, multi-dimensional ethical analysis of ChatGPT from a technology ethics perspective. It constructs a comprehensive analytical framework, examining ethical implications at the micro for individual, meso for organizational, and macro for societal and global levels. Our analysis systematically maps both the significant ethical benefits, such as enhanced accessibility, educational empowerment, and economic optimization, and the critical challenges, including issues of authorship attribution, misinformation, labor market disruption, political manipulation, environmental costs, and opacity of the underlying models. The study concludes that the ethical landscape of ChatGPT is inherently socio-technical, requiring coordinated, multi-stakeholder governance. It provides structured insights and practical recommendations for developers, policymakers, and educators to navigate these challenges, thereby contributing to the responsible development and deployment of generative AI technologies.

Keywords: generative AI; ChatGPT; technology ethics; multi-level analysis; responsible governance; socio-technical systems

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1. Introduction

The field of artificial intelligence (AI) is undergoing a profound transformation, driven by the rapid evolution of large language models (LLMs) and generative AI. These models, capable of producing coherent, context-aware, and human-like text, have moved from theoretical research to widespread public application. Among these, ChatGPT, developed by OpenAI, has emerged as a pivotal phenomenon, demonstrating unprecedented capabilities in natural language understanding and generation. Its rapid adoption across diverse domains from education and research to business and creative arts highlights its disruptive potential and underscores its role as a defining technology of the current digital era.

This transformative potential, however, is accompanied by a complex array of ethical challenges. The very attributes that contribute to ChatGPT's success, its high linguistic fidelity, conversational versatility, and ability to seamlessly integrate into human workflows also form the core of its ethical predicament. Key concerns include the erosion of clear authorship and academic integrity, the proliferation of sophisticated misinformation, the potential for embedding and amplifying societal biases, significant disruptions to labor markets, and substantial environmental costs associated with its operation. While a growing body of literature has begun to identify these issues, the

current ethical discourse often remains fragmented, oscillating between alarmist risk assessments and optimistic endorsements of utility. A critical gap exists in the systematic mapping and analysis of these ethical implications within a cohesive framework that can simultaneously account for individual, organizational, and societal impacts.

To address this gap, this paper aims to present a systematic and multi-dimensional ethical analysis of ChatGPT. The primary research question is: How can the multifaceted ethical implications of ChatGPT be comprehensively structured and evaluated to guide responsible development and governance? To answer this, we pursue three specific objectives: first, to construct a consolidated technology ethics framework suitable for analyzing LLMs; second, to apply this framework to systematically identify and categorize the ethical benefits and challenges of ChatGPT across micro, meso, and macro levels; and third, to derive coherent and practical governance recommendations for key stakeholders, including developers, regulators, and end-users.

2. Literature Review and Theoretical Framework

A systematic ethical analysis of a technology as pervasive as ChatGPT requires a robust theoretical foundation. This chapter surveys the evolution of ethical thought in computing, synthesizes key contemporary frameworks, and ultimately presents the multi-level analytical model that will guide the subsequent investigation in this paper.

2.1. From Computer Ethics to AI Ethics

The ethical examination of technology has a long history. Foundational scholarship, such as Ellul's analysis of the technological society, early on highlighted technology's profound influence on human behavior and social structures [1]. Within the domain of computing, these concerns crystallized into the formal field of Computer Ethics in the late 20th century, which established the initial groundwork for analyzing the social and moral impacts of information technology [2,3]. Moor's concept of policy vacuums generated by new technologies remains particularly pertinent, as ChatGPT exemplifies an innovation that rapidly creates such regulatory and normative gaps in areas like authorship and accountability [3].

As artificial intelligence systems grew more complex and autonomous, the discourse naturally expanded into the dedicated field of AI Ethics. This field inherits core concerns from computer ethics but introduces amplified challenges related to autonomy, opacity, and scale [4]. Contemporary AI ethics has been significantly shaped by frameworks emphasizing principles such as those encapsulated in the FATE (Fairness, Accountability, Transparency, and Ethics) paradigm [5] and the broader approach of Value-Sensitive Design [6]. Generative AI and LLMs like ChatGPT represent a new frontier within this discourse, characterized by their generative nature, human-like interaction capabilities, and potential for widespread, diffuse societal impact. They are accurately classified as emerging technologies due to their rapid development cycle and the significant uncertainty surrounding their long-term applications and consequences [7].

2.2. A Synthesized Multi-Level Analytical Framework

A comprehensive ethical assessment necessitates a framework capable of capturing impacts across different levels of society. While existing frameworks provide valuable insights, they often focus on a single tier of analysis. This work synthesizes these perspectives into a cohesive, tri-level framework comprising the Micro, Meso, and Macro dimensions.

Micro-Level (The Individual): This tier focuses on the direct interface between an individual user and ChatGPT. It concerns issues of immediate personal impact, such as privacy and data agency, the potential for cognitive deskilling or over-reliance, the psychological effects of anthropomorphism, and the manipulation of personal beliefs through highly persuasive, personalized outputs.

Meso-Level (Organizations and Domains): This tier examines the impact of ChatGPT on specific sectors, professions, and institutional structures. Key domains for analysis include:

Education: Challenges to academic integrity and the consequent need for fundamental assessment reform [8].

Research and Publishing: Crises in authorship attribution and the integrity of the scientific record [9].

Industry and Labor: Disruption of knowledge-work professions, including software engineering, writing, and content creation [10,11].

Healthcare: Questions regarding the reliability of generated medical information and patient data privacy [12].

Macro-Level (Society and the Globe): This tier addresses the broadest systemic effects of ChatGPT on societal structures and global order. Critical issues at this level include:

Information Ecosystem: The amplification of misinformation and disinformation at scale, threatening public discourse and democratic integrity [13,14].

Economic and Power Structures: The risk of exacerbating global digital divides and consolidating technological power within oligopolistic corporate entities.

Environmental Sustainability: The substantial computational and carbon footprint associated with training and operating large-scale AI models [14].

Global Governance: The profound challenges of establishing effective international norms and regulations for a borderless technology.

This tripartite framework is predicated on the understanding that ChatGPT operates as a socio-technical system, where technical capabilities and social contexts are inextricably linked. An ethical issue originating at the micro-level such as a student using ChatGPT to complete an assignment can aggregate into a meso-level crisis and ultimately contribute to a macro-level challenge devaluation of human knowledge and critical thinking. The following chapters will employ this structured framework to conduct a detailed ethical examination of ChatGPT, ensuring a holistic analysis that captures the interconnected nature of its societal impact.

3. Core Technical Characteristics and Their Ethical Implications

A meaningful ethical analysis of ChatGPT must be grounded in a clear understanding of its underlying technical architecture and capabilities. The ethical challenges it presents are not emergent properties in a vacuum but are directly traceable to its core design and functional characteristics. This chapter delineates these key technical features and systematically links them to their resultant ethical ramifications, thereby providing a cause-and-effect foundation for the multi-level analysis that follows.

3.1. Architectural Foundations and Key Capabilities

ChatGPT is built upon OpenAI's Generative Pre-trained Transformer (GPT) architecture, a class of large-scale neural network models based on the transformer design [15]. Its functionality is the product of a two-stage process: a) initial pre-training on a massive and diverse corpus of internet text to develop a statistical understanding of language, and b) subsequent fine-tuning using Reinforcement Learning from Human Feedback (RLHF) to align its outputs with human preferences for helpfulness, safety, and conversational quality [16]. This technical groundwork enables several pivotal capabilities:

(1) High-Fidelity Text Generation: The model produces coherent, contextually relevant, and syntactically sophisticated text that is often indistinguishable from human-authored content [17].

(2) Conversational Versatility: It can engage in dialogues across a vast spectrum of topics, maintaining context over extended interactions.

(3) Instruction Following and Stylistic Adaptation: It can modify its output to adhere to specific prompts, tones, and linguistic conventions [18].

(4) Continuous Learning from Interaction: Through mechanisms like RLHF, the model's performance is designed to improve over time based on user interactions.

3.2. Linking Technical Features to Ethical Consequences

The very capabilities that constitute ChatGPT's utility are the primary sources of its ethical complexity. The following analysis explicitly connects these technical features to the ethical issues they precipitate.

(1) High-Fidelity Text Generation and Opacity:

Technical Feature: The ability to generate human-like text and the black-box nature of deep neural networks.

Ethical Implications: This combination directly leads to challenges in authorship attribution and academic integrity. It facilitates the generation of sophisticated misinformation and disinformation, as fabricated content is more convincing. The opacity also complicates accountability a key principle of FATE, making it difficult to audit the model's decision-making process or assign responsibility for harmful outputs.

(2) Training on Large-Scale, Uncurated Data:

Technical Feature: The model is trained on vast datasets scraped from the internet, which contain both high-quality information and societal biases, inaccuracies, and copyrighted material.

Ethical Implications: This results in the perpetuation and amplification of societal biases related to race, gender, and culture [19]. It raises significant intellectual property and copyright concerns, as the model may reproduce or derive content from its training data without clear attribution [20]. Furthermore, it can hallucinate or generate plausible but false information, posing risks in high-stakes domains like healthcare and law [12].

(3) Conversational Versatility and Anthropomorphism:

Technical Feature: The capacity for seamless, open-ended dialogue on any topic.

Ethical Implications: This fosters user over-reliance and potential cognitive deskilling a micro-level concern, as users may outsource critical thinking to the AI. It also raises issues of informed consent, as users might not understand the system's limitations, and psychological manipulation, especially in vulnerable contexts. At a macro-level, this capability can be weaponized for automated, personalized political lobbying or influence operations [13].

(4) Reinforcement Learning from Human Feedback:

Technical Feature: The fine-tuning process based on human preferences.

Ethical Implications: While intended to align the AI with human values, RLHF introduces its own set of concerns. The value-laden choices of the human raters are embedded into the system, potentially imposing a specific cultural or corporate worldview [21]. This process can also lead to the alignment tax, where making the model safer may reduce its utility or performance on certain tasks, creating ethical trade-offs.

(5) Significant Computational Resource Requirements:

Technical Feature: The immense energy consumption required for training and inferencing with models of this scale.

Ethical Implications: This translates directly into a substantial environmental footprint and carbon cost, a critical macro-level ethical issue related to sustainability and climate justice [14]. It also contributes to the centralization of power in well-resourced corporations, potentially exacerbating global digital divides.

In summary, ChatGPT is not a neutral tool; it is a socio-technical artifact whose ethical dimensions are hardwired into its technical DNA. The following chapter will leverage this foundational understanding to structure a detailed examination of these implications across the micro, meso, and macro levels of society.

4. A Multi-Level Analysis of Ethical Challenges and Benefits

Building upon the technical-ethical linkages established in the previous chapter, this section employs the multi-level analytical framework to conduct a systematic examination of the ethical landscape of ChatGPT. This structured approach allows for a holistic understanding of its impacts, from the individual user to global societal systems, while also acknowledging the potential benefits that warrant consideration.

4.1. Micro-Level: Impacts on the Individual

At the individual level, ChatGPT's interaction paradigm presents a dualism of empowerment and risk.

Ethical Challenges: A primary concern is cognitive deskilling and over-reliance. The ease of outsourcing tasks like writing, summarizing, and problem-solving may lead to the atrophy of critical cognitive and creative faculties in users [22]. Furthermore, the model's conversational proficiency fosters anthropomorphism, which can blur the line between tool and entity, potentially leading to emotional dependence, manipulation, and eroded trust, especially when the system produces plausible inaccuracies [23]. From a privacy perspective, user interactions constitute sensitive data, raising concerns about data agency and surveillance, particularly regarding how prompts and conversations are stored, used, or potentially leaked [24].

Ethical Benefits: Conversely, ChatGPT can serve as a powerful tool for cognitive augmentation and personalized learning. It can act as an on-demand tutor, explaining complex concepts or assisting with language acquisition, thereby democratizing access to knowledge and supporting self-directed education [25]. It also functions as a creativity and productivity catalyst, helping individuals overcome creative blocks, draft documents, and debug code, thereby enhancing their personal and professional efficacy.

4.2. Meso-Level: Disruption and Transformation in Sectors

The integration of ChatGPT is forcing a re-evaluation of established practices across multiple industries.

Ethical Challenges: The education sector faces a crisis of academic integrity and assessment validity, challenging traditional evaluation methods and necessitating a fundamental redesign of pedagogical approaches [8]. In academic publishing, the ambiguity of AI-generated content disrupts established authorship and contribution norms, threatening the integrity of the scholarly record [9]. For the workforce, there is a tangible risk of labor market disruption and displacement, particularly for roles centered around content creation, basic coding, and information synthesis. In high-stakes domains like healthcare and law, the risk of liability and misinformation is paramount, where an AI "hallucination" could lead to dire real-world consequences [26].

Ethical Benefits: At an organizational level, ChatGPT offers significant gains in operational efficiency and cost reduction. It can automate routine tasks in customer service, technical support, and content generation, freeing human capital for more complex and strategic work [27]. It also serves as a powerful tool for innovation and research acceleration, capable of assisting scientists and engineers in literature review, hypothesis generation, and code prototyping, thereby speeding up the pace of discovery and development.

4.3. Macro-Level: Systemic Societal and Global Repercussions

The aggregate effects of widespread ChatGPT adoption pose profound questions for society.

Ethical Challenges: The technology significantly exacerbates the misinformation and disinformation ecosystem. Its ability to generate persuasive, tailored content at scale can be weaponized to manipulate public opinion, undermine democratic processes, and erode social trust. Its development and deployment are also highly resource-intensive,

contributing to a substantial environmental footprint and potentially widening global digital divides by concentrating advanced AI capabilities within a few corporations and nations [14]. This concentration of power raises alarms about technological oligopoly and the erosion of democratic control over a transformative technology.

Ethical Benefits: On a societal scale, ChatGPT can powerfully democratize access to expertise and knowledge. It can lower barriers to high-quality information, legal aid, and programming skills, potentially promoting a more equitable distribution of knowledge resources [28]. When governed responsibly, it can also enhance public services and governance, for instance, by improving the accessibility and responsiveness of government information portals or aiding in the analysis of public policy data.

This multi-level analysis demonstrates that the ethical profile of ChatGPT is not monolithic but varies significantly across different contexts and stakeholders. The following chapter will synthesize these findings to propose governance pathways that can mitigate the identified risks while harnessing the potential benefits.

5. Discussion and Governance Recommendations

5.1. Synthesis of Core Findings

The primary conclusion of this analysis is that ChatGPT functions as a socio-technical ecosystem, wherein ethical issues are not isolated but interconnected across different levels. A micro-level issue, such as a student's over-reliance on the tool, aggregates into the meso-level crisis of academic integrity, which in turn contributes to the macro-level challenge of devaluing human-generated knowledge and critical thinking. Similarly, the technical feature of high-fidelity text generation (Chapter 3) is the root cause of problems spanning from individual deception (Micro) to widespread disinformation campaigns (Macro). This interconnectedness necessitates a holistic, rather than a piecemeal, governance approach. The analysis also underscores that many ethical concerns, such as bias, opacity, and environmental cost, are not merely accidental byproducts but are deeply embedded in the model's data, architecture, and economic model.

5.2. A Multi-Stakeholder Governance Framework

Addressing these intertwined challenges requires coordinated action from all actors in the AI ecosystem. The following recommendations are structured by stakeholder group:

For Developers and Industry:

Advance Transparency and Explainability: Move beyond black-box models by investing in research on Explainable AI (XAI) and providing detailed documentation of a model's capabilities, limitations, and training data characteristics e.g., following the concept of model cards or datasheets for datasets [29].

Implement Robust Auditing and Red-Teaming: Establish pre-deployment and continuous adversarial testing frameworks to proactively identify and mitigate risks related to bias, misinformation, and security vulnerabilities [30].

Embed Value-Sensitive Design: Integrate ethical reasoning throughout the development lifecycle, using frameworks like Value-Sensitive Design [6] to explicitly consider and address the values and potential harms to diverse user groups and societies.

For Regulators and Policymakers:

Develop Risk-Based Regulations: Establish legal frameworks that impose stricter requirements for high-risk applications e.g., in healthcare, law, finance while allowing for lighter-touch regulation for lower-risk uses, as seen in the European Union's AI Act [31].

Mandate Clear Labeling and Disclosure: Enforce standards that require clear and conspicuous labeling of AI-generated content, helping to preserve the integrity of information ecosystems and manage user expectations.

Fund Independent Research and Standardization: Support independent, public-interest research on AI safety and societal impact, and promote the development of technical standards for auditing, safety, and interoperability.

For Educational Institutions and Users:

Integrate AI Literacy into Curricula: Educate students and the public on the capabilities, limitations, and ethical dimensions of AI tools, fostering critical thinking and responsible usage rather than resorting to ineffective blanket bans [32].

Revise Pedagogical and Assessment Methods: Transform educational practices to emphasize process, critical analysis, and oral defense over easily automatable outputs, thereby preserving academic integrity and fostering deeper learning.

5.3. Limitations and Future Research

This study has certain limitations. As a conceptual analysis, it is based on a synthesis of existing literature and logical reasoning; it would be strengthened by complementary empirical studies measuring the real-world prevalence and impact of the identified ethical issues. Furthermore, the pace of AI development is relentless, and the ethical landscape will evolve with the advent of more powerful multi-modal models and agentic AI systems.

Future research should, therefore, focus on: 1) Empirical Validation: Conducting large-scale studies to quantify impacts on cognition, employment, and misinformation; 2) Technical Mitigations: Advancing research on watermarking AI-generated content, bias detection and mitigation, and energy-efficient model architectures; and 3) Governance Efficacy: Critically evaluating the effectiveness and unintended consequences of proposed governance measures and ethical guidelines in practice.

6. Conclusion

This study has undertaken a systematic and multi-dimensional exploration of the ethical landscape surrounding ChatGPT, guided by a synthesized analytical framework that traverses the micro, meso, and macro levels of its impact. The analysis confirms that the ethical profile of ChatGPT is profoundly complex and ambivalent, characterized by a duality of significant benefits and profound risks that are deeply embedded within its technical architecture and mode of interaction. At the micro-level, it functions as both a tool for cognitive augmentation and a potential catalyst for deskilling and over-reliance. At the meso-level, it drives operational efficiency and innovation while simultaneously disrupting foundational norms in education, academia, and labor markets. At the macro-level, it holds the promise of democratizing knowledge while posing severe threats to the integrity of the information ecosystem, environmental sustainability, and global equity.

The central argument of this paper is that navigating this duality requires a holistic, socio-technical perspective. The ethical challenges of ChatGPT are not a collection of isolated issues but are interconnected phenomena that demand coordinated and multi-stakeholder governance. The proposed framework, which calls for Ethics by Design from developers, Adaptive Governance from policymakers, and AI Literacy from educational institutions and users, provides a foundational pathway toward responsible development. The journey toward ethically aligned generative AI is continuous and collective. It necessitates ongoing critical scrutiny, inclusive dialogue, and a steadfast commitment to ensuring that these powerful technologies are steered to serve and enhance, rather than undermine, fundamental human values and societal well-being.

References

1. D. Baidoo-Anu, and L. O. Ansah, "Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning," *Journal of AI*, vol. 7, no. 1, pp. 52-62, 2023.
2. C. Breazeal, "Toward sociable robots," *Robotics and autonomous systems*, vol. 42, no. 3-4, pp. 167-175, 2003. doi: 10.1016/s0921-8890(02)00373-1
3. T. W. Bynum, "Computer ethics: Its birth and its future," *Ethics and Information Technology*, vol. 3, no. 2, pp. 109-112, 2001. doi: 10.1023/a:1011893925319
4. M. T. Baldassarre, D. Caivano, B. Fernandez Nieto, D. Gigante, and A. Ragone, "The social impact of generative ai: An analysis on chatgpt," In *Proceedings of the 2023 ACM Conference on Information Technology for Social Good*, September, 2023, pp. 363-373. doi: 10.1145/3582515.3609555

5. J. Ellul, "The technological society," *Vintage*, 2021.
6. D. O. Eke, "ChatGPT and the rise of generative AI: Threat to academic integrity?," *Journal of Responsible Technology*, vol. 13, p. 100060, 2023. doi: 10.1016/j.jrt.2023.100060
7. P. Hacker, A. Engel, and M. Mauer, "Regulating ChatGPT and other large generative AI models," In *Proceedings of the 2023 ACM conference on fairness, accountability, and transparency*, June, 2023, pp. 1112-1123. doi: 10.1145/3593013.3594067
8. B. Friedman, and D. G. Hendry, "Value sensitive design: Shaping technology with moral imagination," *Mit Press*, 2019.
9. E. Kazim, and A. S. Koshiyama, "A high-level overview of AI ethics," *Patterns*, vol. 2, no. 9, 2021. doi: 10.1016/j.patter.2021.100314
10. D. Kaur, S. Uslu, K. J. Rittichier, and A. Durresi, "Trustworthy artificial intelligence: a review," *ACM computing surveys (CSUR)*, vol. 55, no. 2, pp. 1-38, 2022. doi: 10.1145/3491209
11. R. Gozalo-Brizuela, and E. C. Garrido-Merchan, "ChatGPT is not all you need," A State of the Art Review of large Generative AI models. arXiv preprint arXiv:2301.04655, 2023.
12. B. Memarian, and T. Doleck, "Fairness, Accountability, Transparency, and Ethics (FATE) in Artificial Intelligence (AI) and higher education: A systematic review," *Computers and Education: Artificial Intelligence*, vol. 5, p. 100152, 2023. doi: 10.1016/j.caeai.2023.100152
13. R. Meier, "Balancing Minds and Data: The Privacy Dilemma of LLMs and Anthropomorphism in LLMs," *Journal of Social Computing*, vol. 6, no. 3, pp. 173-183, 2025. doi: 10.23919/jsc.2025.0014
14. J. Miao, C. Thongprayoon, S. Suppadungsuk, O. A. Garcia Valencia, F. Qureshi, and W. Cheungpasitporn, "Ethical dilemmas in using AI for academic writing and an example framework for peer review in nephrology academia: a narrative review," *Clinics and Practice*, vol. 14, no. 1, pp. 89-105, 2023. doi: 10.3390/clinpract14010008
15. M. Mitchell, S. Wu, A. Zaldivar, P. Barnes, L. Vasserman, B. Hutchinson, and T. Gebru, "Model cards for model reporting," In *Proceedings of the conference on fairness, accountability, and transparency*, January, 2019, pp. 220-229. doi: 10.1145/3287560.3287596
16. D. G. Johnson, "Computer ethics," *The Blackwell guide to the philosophy of computing and information*, pp. 63-75, 2004. doi: 10.1002/9780470757017.ch5
17. A. Nandal, and A. Nandal, "Ethical Challenges and Bias in AI Decision-Making Systems," .
18. F. Fui-Hoon Nah, R. Zheng, J. Cai, K. Siau, and L. Chen, "Generative AI and ChatGPT: Applications, challenges, and AI-human collaboration," *Journal of information technology case and application research*, vol. 25, no. 3, pp. 277-304, 2023. doi: 10.1080/15228053.2023.2233814
19. M. M. Megdad, M. H. Abueleiwa, M. Al Qatrawi, J. El-Tantaw, F. E. Harara, B. S. Abu-Nasser, and S. S. Abu-Naser, "Ethics in AI: Balancing innovation and responsibility," 2024.
20. M. Sallam, "ChatGPT utility in healthcare education, research, and practice: systematic review on the promising perspectives and valid concerns," In *Healthcare*, March, 2023, p. 887. doi: 10.3390/healthcare11060887
21. M. Cohen, and E. Toch, "Hijacking algorithmic bias: analyzing the political discourse around ChatGPT on social media," *Information, Communication & Society*, pp. 1-26, 2025. doi: 10.1080/1369118x.2025.2561046
22. C. E. Short, and J. C. Short, "The artificially intelligent entrepreneur: ChatGPT, prompt engineering, and entrepreneurial rhetoric creation," *Journal of Business Venturing Insights*, vol. 19, p. e00388, 2023. doi: 10.1016/j.jbvi.2023.e00388
23. B. C. Stahl, "From computer ethics and the ethics of AI towards an ethics of digital ecosystems," *AI and Ethics*, vol. 2, no. 1, pp. 65-77, 2022. doi: 10.1007/s43681-021-00080-1
24. V. Ratten, and P. Jones, "Generative artificial intelligence (ChatGPT): Implications for management educators," *The International Journal of Management Education*, vol. 21, no. 3, p. 100857, 2023. doi: 10.1016/j.ijme.2023.100857
25. C. J. Costa, M. Aparicio, S. Aparicio, and J. T. Aparicio, "The democratization of artificial intelligence: Theoretical framework," *Applied sciences*, vol. 14, no. 18, p. 8236, 2024. doi: 10.3390/app14188236
26. A. A. Trotsyuk, Q. Waeiss, R. T. Bhatia, B. J. Aponte, I. M. Heffernan, D. Madgavkar, and D. Magnus, "Toward a framework for risk mitigation of potential misuse of artificial intelligence in biomedical research," *Nature Machine Intelligence*, vol. 6, no. 12, pp. 1435-1442, 2024.
27. E. A. Van Dis, J. Bollen, W. Zuidema, R. Van Rooij, and C. L. Bockting, "ChatGPT: five priorities for research," *Nature*, vol. 614, no. 7947, pp. 224-226, 2023.
28. H. Vartiainen, P. Liukkonen, and M. Tedre, "Emerging human-technology relationships in a co-design process with generative AI," *Thinking Skills and Creativity*, vol. 56, p. 101742, 2025. doi: 10.1016/j.tsc.2024.101742
29. A. Vaswani, N. Shazeer, N. Parmar, J. Uszkoreit, L. Jones, A. N. Gomez, and I. Polosukhin, "Attention is all you need," *Advances in neural information processing systems*, vol. 30, 2017.
30. S. Verma, N. Paliwal, K. Yadav, and P. C. Vashist, "Ethical Considerations of Bias and Fairness in AI Models," In *2024 2nd International Conference on Disruptive Technologies (ICDT)*, March, 2024, pp. 818-823. doi: 10.1109/icdt61202.2024.10489577
31. C. Zhai, S. Wibowo, and L. D. Li, "The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review," *Smart Learning Environments*, vol. 11, no. 1, p. 28, 2024. doi: 10.1186/s40561-024-00316-7
32. Z. Chaoning, C. Zhang, C. Li, S. ZHENG, S. K. DAM, M. ZHANG, and C. S. HONG, "One small step for generative ai, one giant leap for agi: A complete survey on chatgpt in aigc era," 2022.