


# Chapter 12

## Restructuring the Landscape of Generative AI Research

**Salaheldin Mohamed Ibrahim Edam**

 <https://orcid.org/0000-0002-8280-8745>

*Sudan University of Science and Technology, Sudan*

### **ABSTRACT**

*This Chapter delves into the impact of generative AI on academic research and publishing, discussing various architectures such as Mixture of Experts (MoE), Generative Adversarial Networks (GANs), Variational Autoencoders (VAEs), and Generative Pre-trained Transformers (GPT). The research explores the increase of AI-centered preprints, their effects on peer review, and the ethical considerations linked to them. The peer-review system's integrity is under examination, focusing on challenges related to AI, misuse, and redefining plagiarism. The chapter explores the potential of AI tools to improve peer review processes and stresses the importance of academic institutions creating ethical frameworks for AI utilization. The article concludes by evaluating the advantages and drawbacks of generative AI in research, with the goal of presenting a fair viewpoint on its revolutionary capabilities while upholding ethical principles.*

### **I. INTRODUCTION**

The research in generative AI has gained importance due to the progress in AI technology. Generative AI represents an innovative artificial intelligence technology capable of autonomously generating fresh content through the utilization of input data (Lv, 2023). Generative AI encompasses computational methods that can produce

DOI: 10.4018/979-8-3693-0884-4.ch012

Copyright © 2025, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

fresh and significant content, including text, images, or audio, by utilizing training data (Feuerriegel, Hartmann, Janiesch, & Zschech, 2024). Artificial intelligence (AI) that is generative has brought about substantial progress in multiple fields, such as machine learning, creative arts, computer vision, and robotics (Zhu, 2022), (Bandi, Adapa, & Kuchi, 2023). In the future, generative artificial intelligence (GAI or GenAI) will bring about a significant change in the field of artificial intelligence research. This shift will include new frontiers such as quantum-inspired generative models, collaboration between human and artificial intelligence, and the ethical considerations of GAI (Santojanni, Giannini, & Ciasullo). Generative AI models are designed to analyze patterns and structures within training data in order to create new content, in contrast to traditional AI systems that are mainly focused on classification and prediction tasks (Kumar, Kait, Ankita, & Malik, 2023). Generative AI models have progressed in diverse fields through distinct trajectories, culminating in a convergence at a common intersection (Cao et al., 2023). GAI and Large Language Models (LLMs) are at the forefront of artificial intelligence, providing revolutionary abilities in content creation and comprehension of natural language. These technologies signify significant progress in the field of AI, with the potential to greatly impact various industries and applications. Various models fall under the umbrella of Generative AI, ranging from text-based systems like ChatGPT (Conversational Generative Pre-training Transformer) to image generation models like DALL-E and Midjourney. These models utilize extensive data training to generate unique content across various modalities, such as text, images, audio, and videos (Linkon et al., 2024). The influence of generative AI goes beyond creating text and images, reaching into various research fields such as biology and weather prediction (Manduchi et al., 2024). The landscape of Generative AI research is experiencing a notable shift due to the emergence of advanced AI technologies like Mixture of Experts (MoE), multimodality, besides Artificial General Intelligence (AGI), (McIntosh, Susnjak, Liu, Watters, & Halgamuge, 2023). The integration of AI tools and instructional design matrices has revolutionized the way learning activities are conceptualized and implemented (Edam, 2024). It is imperative for those involved in education to acknowledge that technological advancements are not simply supplementary elements to current methods, but rather powerful agents that have the potential to completely redefine the educational framework (Baskara, 2023).

The assessment of generative AI methods' effectiveness has grown in significance as these models progress in sophistication and capacity. Evaluating the performance and efficiency of generative AI systems has become essential in a wide range of fields, including natural language processing, computer vision, and creative arts, to guarantee their dependability and practicality (Bandi et al., 2023). The implementation of AI-generated content (AIGC) presents numerous challenges that necessitate ongoing research, cooperation, and interdisciplinary initiatives.

46 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/restructuring-the-landscape-of-generative-ai-research/358778](http://www.igi-global.com/chapter/restructuring-the-landscape-of-generative-ai-research/358778)

## Related Content

---

### Cancer Diagnosis Using Artificial Intelligence (AI) and Internet of Things (IoT)

Samiksha Garse, Khadija Shahab Turabi, Jyotirmoi Aich, Amit Ranjan, Shuchi Nagar, Soumya Basu and Shine Devarajan (2023). *Revolutionizing Healthcare Through Artificial Intelligence and Internet of Things Applications* (pp. 50-71).

[www.irma-international.org/chapter/cancer-diagnosis-using-artificial-intelligence-ai-and-internet-of-things-iot/324935](http://www.irma-international.org/chapter/cancer-diagnosis-using-artificial-intelligence-ai-and-internet-of-things-iot/324935)

### User Relevance Feedback in Semantic Information Retrieval

Antonio Picariello and Antonio M. Rinaldi (2007). *International Journal of Intelligent Information Technologies* (pp. 36-50).

[www.irma-international.org/article/user-relevance-feedback-semantic-information/2417](http://www.irma-international.org/article/user-relevance-feedback-semantic-information/2417)

### Taxonomy on Ambient Computing: A Research Methodology Perspective

Diganta Sengupta (2020). *International Journal of Ambient Computing and Intelligence* (pp. 1-33).

[www.irma-international.org/article/taxonomy-on-ambient-computing/243445](http://www.irma-international.org/article/taxonomy-on-ambient-computing/243445)

### Turning Homes into Low-Cost Ambient Assisted Living Environments

Alexiei Dingli, Daniel Attard and Ruben Mamo (2012). *International Journal of Ambient Computing and Intelligence* (pp. 1-23).

[www.irma-international.org/article/turning-homes-into-low-cost/66856](http://www.irma-international.org/article/turning-homes-into-low-cost/66856)

### Case Studies in Applying Data Mining for Churn Analysis

Susan Lomax and Sunil Vadera (2017). *International Journal of Conceptual Structures and Smart Applications* (pp. 22-33).

[www.irma-international.org/article/case-studies-in-applying-data-mining-for-churn-analysis/189219](http://www.irma-international.org/article/case-studies-in-applying-data-mining-for-churn-analysis/189219)