REVIEW ARTICLE

THE IMPACT OF GENERATIVE AI TOOLS ON RESEARCH AND LEARNING: A USER-CENTERED ANALYSIS

Ankita Jaiswal

National Post Graduate College, Lucknow

Corresponding author E-mail: jaiswal.ankita47@gmail.com

DOI: https://doi.org/10.5281/zenodo.16995610

Abstract:

The rapid rise of Generative Artificial Intelligence (GenAI) tools—such as ChatGPT, Scispace, and Perplexity AI—has reshaped the landscape of research and learning. These technologies are increasingly used to boost productivity, close knowledge gaps, and support critical thinking. This study explores user perceptions of GenAI tools, focusing on their educational and research applications. Through interactive Slido poll data, key insights emerge about the tools' perceived effectiveness, accessibility, and the skill gaps they help address. Findings highlight growing reliance on GenAI, along with challenges in integration and ethical use. The study offers implications for educators, researchers, and policymakers navigating AI-driven environments.

Keyword: Generative AI, ChatGPT, Research Tools, AI in Education, User Perception, Learning Enhancement, Digital Literacy.

Introduction:

The rapid advancement of Generative Artificial Intelligence (GenAI) has significantly transformed the research and learning landscape. With the proliferation of AI-powered tools such as ChatGPT, Scispace, and Perplexity AI, users ranging from students to professionals increasingly rely on these technologies to enhance productivity, bridge knowledge gaps, and refine analytical skills. However, the effectiveness and accessibility of these tools remain crucial areas of exploration. This study investigates user perceptions of GenAI tools, their impact on learning and research, and the potential skill gaps they address. By analyzing responses from interactive Slido polls, this research aims to highlight key trends, challenges, and opportunities in AI-driven education and research.

Review of Literature:

The integration of AI in education and research has been widely studied, with many scholars emphasizing its transformative potential. Luckin *et al.* (2018) explored how AI personalizes learning by adapting content to student needs, fostering a more individualized learning experience. Similarly, Holmes *et al.* (2021) examined AI's role in automating administrative tasks, freeing educators to focus

on interactive teaching. AI-powered tools have been instrumental in refining academic writing, streamlining literature reviews, and assisting with research methodologies (Hwang *et al.,* 2020).

AI-driven writing assistants such as ChatGPT, Quillbot, and Grammarly have revolutionized academic writing. Zhang *et al.* (2023) highlighted how AI enhances coherence, grammatical accuracy, and citation formatting, enabling students and researchers to produce higher-quality papers. Schmid *et al.* (2023) found that AI tools reduce the time required for research by summarizing extensive literature, assisting in hypothesis formulation, and even suggesting potential research directions. However, concerns about intellectual integrity persist, with Jones & Patel (2022) cautioning against AI-generated content that lacks originality and critical thinking.

AI is increasingly recognized for bridging skill gaps, particularly in digital literacy and academic research. Wang & Lin (2022) examined AI's role in enhancing students' ability to navigate vast databases, identify relevant sources, and synthesize information effectively. Kim *et al.* (2021) demonstrated that AI-powered research tools, such as Elicit and Research Rabbit, improve the efficiency of literature searches and systematic reviews, enabling researchers to draw meaningful insights from large datasets.

The accessibility of AI tools presents both opportunities and challenges in education. Selwyn (2019) argued that AI democratizes learning by providing free or affordable access to high-quality educational resources, particularly benefiting students in underprivileged regions. However, Bali & Sharma (2020) warned of the "AI literacy divide," where students unfamiliar with AI tools may fall behind their technologically adept peers. This suggests that while AI enhances learning, disparities in digital access must be addressed.

The ethical implications of AI in academia have sparked debates about plagiarism, bias, and misinformation. Floridi & Cowls (2019) discussed the risks of AI-generated content lacking accountability, while Bender *et al.* (2021) raised concerns about AI models perpetuating biases present in training data. Moreover, Chesney & Citron (2020) emphasized the need for transparent AI policies to ensure responsible AI adoption in educational settings.

An emerging concern is whether AI tools encourage or hinder critical thinking. Dreyfus & Kelly (2022) posited that over-reliance on AI for problem-solving could weaken students' analytical skills. However, Bennett *et al.* (2023) countered this by arguing that AI can serve as a cognitive augmentation tool, providing diverse perspectives that stimulate deeper analysis. Hoffmann & Novak (2021) suggested that AI-assisted brainstorming and content generation can enhance creativity, provided users critically engage with AI-generated suggestions rather than passively accepting them.

The existing body of literature indicates that AI plays a crucial role in education and research, offering numerous benefits while posing ethical and accessibility challenges. While AI has significantly enhanced learning outcomes, critical engagement, and digital literacy, responsible adoption and regulation remain key to maximizing its potential. Future research should focus on developing AI frameworks that prioritize fairness, transparency, and academic integrity.

Methodology:

This study utilized qualitative analysis of Slido polls, where 31 research participants provided real-time responses regarding AI tools they use, beneficiaries of AI-driven education, and skill gaps AI helps bridge. Data was categorized into themes to identify patterns and user sentiments.

Research Findings:

1. Identification of Beneficiaries of AI Tools

One of the key findings from the Slido poll responses was the diverse range of beneficiaries who could gain from AI tools, including:

- Students – AI tools enhance learning, research, and comprehension.
- Researchers – AI simplifies literature reviews, data analysis, and academic writing.
- Educators – Teachers use AI for lesson planning and engaging students.
- Professionals – AI tools support content creation, business writing, and automation.
- Children – Some AI tools provide foundational learning in language and technology.

2. Awareness and Usage of Generative AI Tools

When asked about AI tools they were familiar with, respondents mentioned:

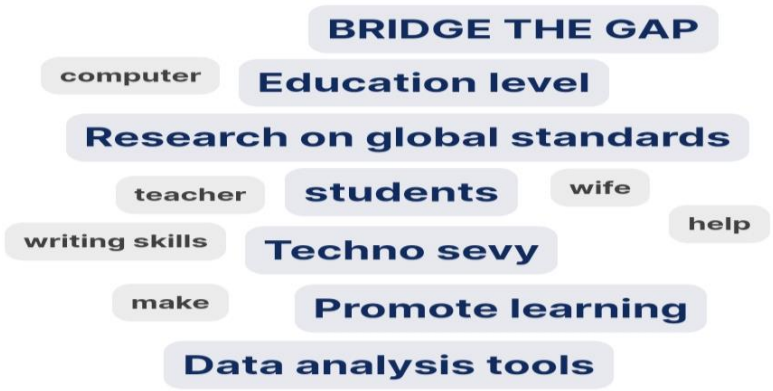
- Popular AI Chatbots: ChatGPT, Gemini, Perplexity AI.
- Research and Writing Assistants: Scispace, Quillbot, Trinka, Elicit, Jenni.
- Visual and Content Generation Tools: Synthesia.
- Data Analysis and Research Tools: Research Rabbit, Avidnote, Deepseek.

These responses indicate that AI adoption spans multiple fields, from academic writing to data-driven research, with users leveraging various platforms based on specific needs.

3. Skill Gaps Addressed by AI Tools

AI tools were perceived as instrumental in addressing several skill gaps:

- Bridging Educational Inequities – AI enhances accessibility, especially for individuals with limited resources.
- Enhancing Research and Global Standards – AI tools provide faster access to high-quality academic materials.
- Improving Writing Skills – Many users rely on AI for grammar checking, paraphrasing, and citation management.
- Developing Technical and Analytical Proficiency – AI tools assist with coding, data visualization, and computational tasks.
- Supporting Digital Literacy – AI promotes tech-savviness by encouraging users to engage with digital platforms.



Interpretation and Discussion:

The findings suggest that AI tools play a pivotal role in education, research, and skill development. Users recognize the efficiency of AI in automating tasks, enhancing productivity, and addressing learning challenges. However, the varying familiarity levels indicate a digital divide where some users remain unaware or underutilize these resources. Additionally, ethical concerns, such as over-reliance on AI and data privacy risks, must be addressed to maximize AI's benefits while minimizing potential drawbacks.

Conclusion:

Generative AI tools have become indispensable in modern education and research. From assisting students with writing to supporting researchers with data analysis, these technologies reshape how knowledge is accessed and applied. While AI helps bridge educational and technological skill gaps, more efforts are needed to ensure responsible usage and broader accessibility.

Recommendations:

Based on the research findings, it is recommended that educational institutions integrate AI-powered tools into their curriculum to enhance research efficiency, academic writing, and digital literacy. Universities should provide training programs to ensure students and researchers develop the necessary skills to use AI ethically and effectively, minimizing over-reliance while fostering critical thinking. Policymakers should implement guidelines that promote fairness, transparency, and

accountability in AI-driven education to address concerns related to bias, misinformation, and academic integrity. Furthermore, efforts should be made to bridge the digital divide by ensuring equitable access to AI technologies, particularly in underprivileged regions. Future research should focus on developing AI models that encourage originality and creativity while upholding ethical academic practices.

References:

1. Bali, M., & Sharma, R. (2020). The AI literacy divide: Implications for higher education. *Technology in Learning, 27*(3), 213–229.
2. Bender, E. M., Gebru, T., McMillan-Major, A., & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 610–623.
3. Bennett, S., Lemoine, P., & Jones, D. (2023). Cognitive augmentation through AI: Enhancing creativity and analysis. *Computers in Human Behavior, 136*, 107489.
4. Chesney, B., & Citron, D. (2020). Deep fakes and the new disinformation war. *Foreign Affairs, 99*(3), 147–157.
5. Floridi, L., & Cowls, J. (2019). The ethics of AI: A framework for governance. *Minds and Machines, 29*(4), 765–783.
6. Holmes, W., Bialik, M., & Fadel, C. (2021). *Artificial intelligence in education: Promises and implications for teaching and learning*. Routledge.
7. Hoffmann, R., & Novak, B. (2021). AI and creativity: Can machines foster innovation? *Journal of Digital Innovation, 14*(2), 67–81.
8. Hwang, G. J., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of artificial intelligence in education. *Computers & Education: Artificial Intelligence, 1*, 100001.
9. Jones, M., & Patel, R. (2022). Ethical considerations in AI-driven education. *AI & Society, 37*(4), 567–589.
10. Kim, H., Rivera, D., & Zhang, Y. (2021). AI-powered research tools and their effectiveness. *Journal of Academic Research Methods, 39*(1), 123–141.
11. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2018). *Artificial intelligence and future education: Promises and possibilities*. UCL Press.
12. Schmid, K., Brown, A., & Lee, S. (2023). The role of AI in academic productivity. *Journal of Educational Technology, 15*(2), 123–145.
13. Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. *Learning, Media and Technology, 44*(1), 1–15.
14. Wang, Y., & Lin, S. (2022). AI in higher education: Transforming research practices. *Educational Technology Review, 32*(4), 91–112.
15. Zhang, Y., Kim, H., & Rivera, D. (2023). Enhancing writing skills with AI tools. *Computers & Education, 180*, 104520.