

Embracing GenAI literacy in education: A roadmap for empowerment

FRANCISCO JOSÉ GARCÍA-PEÑALVO, FULL PROFESSOR, COMPUTER SCIENCE DEPARTMENT, RESEARCH INSTITUTE FOR EDUCATIONAL SCIENCES (IUCE)

UNIVERSIDAD DE SALAMANCA

SPAIN

In the dynamically evolving landscape of technology, 2023 was the advent year of Generative Artificial Intelligence (GenAI), standing as a transformative force in numerous fields, including education. GenAI may be defined as producing previously unseen synthetic content in any form and supporting any task through generative modelling [1]. GenAI literacy, therefore, emerges as a pivotal skill set essential for both teachers and students to prepare the population for teaching and learning in an ever-changing world, where the real challenge will not be a fight between humans and AIs, but between humans with AI skills and those without AI skills.

GenAI literacy means understanding and proficiency in using GAI technologies and their ethical implications. It encompasses a spectrum of skills, from the basic comprehension of how these GenAI-based systems function to the advanced ability to critically assess and creatively deploy such technologies in various domains. GenAI literacy involves not only technical knowledge but also an awareness of the societal, ethical, and philosophical ramifications of these technologies.

Improving general AI literacy (including GenAI) is a real challenge for the current policymakers of society and educational institutions [2].

To foster teachers' GenAI literacy, as well as organising training sessions, the following actions, among others, should be considered:

1. Curriculum integration: Integrating GenAI concepts into existing curricula is essential. This does not necessitate the overhaul of current syllabi but rather the inclusion of GenAI elements in relevant subjects.
2. Professional development workshops: Tailored workshops for educators should be a priority. These workshops should equip teachers with the technical know-how and pedagogical strategies to use GenAI literacy effectively. The emphasis should be on practical, hands-on sessions where educators can interact with GenAI tools and explore their applications in teaching and learning.
3. Collaborative learning communities: Establishing learning communities where educators can share experiences, resources, and best practices is vital.

On the other hand, enhancing GenAI literacy among students should be mandatory to avoid misconceptions when using these tools as the new wisdom realm.

1. Critical thinking and ethical reasoning: Encouraging students to critically evaluate the outputs of GenAI and consider the ethical dimensions of AI use is crucial. Classroom discussions, debates, and reflective essays on AI bias, privacy, and intellectual property can cultivate a more nuanced understanding.
2. Active-based learning: Implementing active-based learning strategies where students actively engage with GenAI tools can foster a more profound understanding.

3. Interdisciplinary approaches: GenAI literacy should not be confined to computer science or STEM fields alone. Incorporating AI-related themes in humanities, arts, and social sciences can demonstrate the cross-disciplinary nature of AI and its wide-ranging impacts.

GenAI literacy is not merely about mastering a set of tools; it is about cultivating an informed and critical perspective towards one of the most influential technologies of our era through considering and developing complex thinking competencies [3]. Improving GenAI literacy will build a solid foundation for the responsible and innovative use of AI in our societies. This will empower future generations to navigate and shape the AI-augmented landscapes of their times.

Relevant literature resources

[1] García-Peñalvo, F. J., & Vázquez-Ingelmo, A. (2023). What do we mean by GenAI? A systematic mapping of the evolution, trends, and techniques involved in GAI. *International Journal of Interactive Multimedia and Artificial Intelligence*, 8(4), 7-16. <https://dx.doi.org/10.9781/ijimai.2023.07.006>

[2] García-Peñalvo, F. J., Llorens-Largo F., & Vidal, J. (2024). The new reality of education in the face of advances in generative artificial intelligence. *RIED: Revista Iberoamericana de Educación a Distancia*, 27(1), 9-39. <https://doi.org/10.5944/ried.27.1.37716>

[3] Ramírez-Montoya, M. S., Castillo-Martínez, I. M., Sanabria-Z, J., & Miranda, J. (2022). Complex thinking in the framework of education 4.0 and open innovation – A systematic literature review. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), Article 4. <https://doi.org/10.3390/joitmc8010004>