

Editorial



Generative artificial intelligence (GAI) has emerged as one of the most transformative forces in the fast-changing artificial intelligence (AI) landscape promising revolution across many sectors including education. Specifically, in the context of engineering education, Generative Artificial Intelligence can serve as an important tool for improving not only student's learning and faculty research processes but can also cater in developing future engineers who will be capable of working in such dynamic environments. The use of GAI in engineering education has enormous potential for personalized learning. In the traditional classroom settings, faculties often struggle to adapt their teaching methods to the individual needs of students due to varying learning styles, learning pace and comprehension, that too in large size classrooms. Generative AI can help bridge this gap by offering tailored and adaptable teaching and learning experiences. By analysing a student's learning style, strengths, and weaknesses, AI systems can create customized study plans and resources to match the student's learning style and their capacity to learn, ensuring that they receive all the support needed to excel. This personalized approach will not only enhance their understanding but also foster their deeper engagement with the subject content. GAI can also do wonders in transforming the creation and delivery of educational content. Textbooks, lecture materials, and even the problem sets of all difficulty levels, simple to complex problems can be generated dynamically, and can help faculty ensure that the content is up-to-date and relevant. This adaptability is crucial in fields like engineering, where knowledge and technology are consistently evolving. Moreover, AI-generated simulations and virtual laboratories can help in providing the very much needed hands-on experience in a controlled, risk-free environment to the students. They can experiment with different scenarios and learn from their mistakes without facing the constraints of physical resources. In addition to improving the learning experience, generative AI can also, impact the research and development within engineering education significantly. AI algorithms can sift vast amount of data and identify patterns and insights that can be missed by human researchers many a time. Moreover, AI-powered tools can assist in the design and testing of new engineering solutions and thereby reducing the time and cost associated with traditional methods. This will not only benefit students and educators but also create far-reaching implications for the engineering industry as a whole. As seen, the generative AI has immense potential benefits in engineering education, it is essential to address the ethical and societal implications of using this technology by the students or faculties per se. The issues such as data privacy, algorithmic bias, and the impact on employment must be addressed and educators

and policymakers must work together to develop guidelines and frameworks to develop an insight on the responsible and ethical use of GAI. Moreover, it is crucial to equip students with the knowledge and skills to navigate these challenges. Incorporating ethical use of GAI and social responsibility into the engineering curriculum will help and prepare students for work of the future.

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