

Editorial



Engineering Education in the Age of Artificial Intelligence: From AI Literacy to Professional Judgement Artificial Intelligence (AI) is rapidly transforming engineering practice. Across disciplines, engineers are increasingly using AI to analyse information, identify patterns, generate solutions, automate processes, and improve productivity. Consequently, AI literacy is becoming an essential capability for engineering graduates entering the profession. However, engineering education must address a critical question: How can we prepare engineers to use AI effectively without becoming dependent on it?

The distinction is important because industry expects engineers to use AI as a powerful tool, but not to delegate professional responsibility to it. An AI-generated design may be technically inappropriate, a safety recommendation may be inadequate, or an algorithm may produce a biased outcome. In such situations, accountability cannot rest with the technology. The engineer, organisation, and institution remain responsible.

The engineer of the future, therefore, is unlikely to compete with AI. Rather, the engineer will work with AI while retaining professional judgement. AI can process vast quantities of data, explore alternative designs, identify potential faults, write code, and simulate outcomes. The engineer must determine whether the output is reliable, whether its underlying assumptions are appropriate, and whether the proposed solution is relevant to the specific engineering context.

This requires a transformation in engineering education. Students must learn not only how to use AI, but when to trust it, when to question it, and when not to use its recommendations.

Professional judgement, ethical reasoning and accountability must remain central to engineering education.

Faculty as Enablers of Transformation

Faculty are at the centre of this transformation. Their role must evolve from being primarily transmitters of knowledge to becoming mentors, facilitators of critical thinking, and guides for responsible technology adoption. Faculty themselves must continuously develop AI competencies and redesign learning experiences around authentic engineering problems.

Students should be encouraged to use AI in problem-solving, while being required to explain, verify, challenge and defend AI-assisted solutions. Assessment must therefore move beyond evaluating only the final answer and increasingly examine reasoning, assumptions, validation, ethical considerations and the student's ability to take responsibility for the final decision.

Institutional Leadership for Sustainable Change

Faculty transformation cannot occur in isolation. University and institutional leadership must create an enabling ecosystem for AI-integrated education. This requires investment in digital and AI infrastructure, faculty development, curriculum renewal, interdisciplinary collaboration and meaningful industry engagement.

Institutions should establish clear frameworks for responsible AI use in teaching, learning, research and assessment, including academic integrity, data privacy and ethical considerations. Curriculum development must become more agile and responsive so that engineering programmes can adapt continuously to technological change while preserving fundamental engineering principles.

Institutional leaders must also create a culture in which faculty can experiment, collaborate and learn continuously. Transformation should not be treated merely as the introduction of new technology; it should be a change in the way engineering education is designed, delivered and evaluated.

The future engineer should be AI-capable but not AI-dependent. Technologies will continue to evolve, but human judgement, professional responsibility, ethics and accountability will remain indispensable. The real purpose of engineering education transformation is therefore not simply to teach students to use AI, but to prepare them to use it wisely, question it intelligently, and remain accountable for the decisions that shape society.

Dr.(Mrs.) Sushma S. Kulkarni

Editor-JEET