

3 - 5 October 2025

Milan , Italy

Integration of Scientific Dissemination and Ethical Use of Artificial Intelligence in Engineering Student Education

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Abstract

Engineering education continually faces the challenge of connecting theoretical knowledge with practical research skills, critical thinking, and effective scientific communication. This paper presents a pedagogical innovation implemented in the Research Methodology course of Industrial Civil Engineering, which integrates a student-led scientific dissemination event. The initiative involves a series of structured workshops, ongoing faculty mentorship, and a final oral presentation colloquium where students present research articles developed during the semester. A key feature is the ethical and responsible use of generative artificial intelligence tools to support writing, critical review, and preparation processes, aligning with the evolving demands of academic and professional environments. Preliminary results show significant improvements in the relevance and methodological rigor of research projects, enhanced oral communication skills, and increased student motivation and engagement. This approach fosters a dynamic learning environment that bridges disciplinary theory with real-world applications and encourages active knowledge sharing within the academic community. By strengthening research, communication, and digital literacy competencies, the program contributes to the holistic development of future engineers prepared to address complex problems and disseminate knowledge effectively in diverse contexts. The model is scalable and adaptable, with potential applications in other engineering and STEM disciplines, highlighting its broader educational impact.

Keywords: Communication; Critical Thinking; Engineering Education; Research; Scientific Dissemination