Beyond the Algorithm: Innovative Use of Inquiry and Arts-Based Methods in Ethics Education for STEM Students in the AI Era

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Abstract:

The rapid integration of Artificial Intelligence (AI) into scientific research presents critical challenges to Research Ethics and Integrity (ERI) within STEM disciplines. Traditional didactic methods often fail to engage students with the complex "grey zones" of AI-assisted research, such as algorithmic bias, blurred authorship, and the "hallucination" of data. This paper presents an innovative and transdisciplinary pedagogical approach developed within the international ERASMUS+ AI-THOS project, which moves beyond passive rule-learning toward active, experiential reflection. Central to this innovation is the synergy of Inquiry-Based Learning (IBL) and Arts-Based Learning (ABL). By employing structured and open inquiry, students shift from being passive recipients of knowledge to "ethical co-designers" who investigate real-world dilemmas like automated surveillance on campus or data-driven discrimination in admissions. Simultaneously, ABL tools (including drama, role-play, digital collage, and creative poetry), are used to "embody" abstract moral concepts, making them emotionally relatable for students in technical fields. The presentation will discuss practical examples of specific innovative scenarios as well as their impact on didactic process such as foster essential 21st-century competencies, including critical thinking, perspective-taking, and responsible decision-making. By integrating human-centered arts with rigorous scientific inquiry, this approach prepares future STEM professionals to navigate the ethical complexities of the AI-driven research landscape with vigilance and integrity.

Keywords:

innovative pedagogy, STEM, research integrity, artificial intelligence, Inquiry-Based Learning (IBL), Arts-Based Learning (ABL).