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Guest Editorial

This special issue of the *International Journal of Engineering Education* presents papers developed from contributions to the Clive L. Dym Mudd Design Workshop XIV, *Engineering Design Education and Artificial Intelligence*, held from May 29 to 31, 2025, at Harvey Mudd College in Claremont, California. Supported by the Center for Design Education, the workshop brought together engineering educators, design researchers, and practitioners to examine how artificial intelligence is changing both the practice of design and the education of future designers. Across the program, participants considered how AI might extend creative and analytical capabilities while preserving critical thinking, human judgment, ethical responsibility, equity, and attention to the people and contexts affected by design.

Harvey Mudd College President Harriet Nembhard opened the workshop by welcoming participants. The three-day program combined three keynote addresses, six thematic presentation sessions, an Ideas Marketplace, a Collaboration Incubator, and a final collective reflection. The structure continued the Mudd Design Workshop tradition of using concise presentations to initiate extended discussion among the full group. This format was especially appropriate for a topic developing as rapidly as artificial intelligence, for which practices, tools, expectations, and institutional responses remain unsettled.

The three keynote addresses framed the workshop from complementary perspectives. Andrew B. Williams, Dean of Engineering at The Citadel, presented *Designing Pathways Across the Artificial Intelligence Divide*, placing access, opportunity, and inclusion at the center of the discussion. Filippo Chiarello of the University of Pisa described *AIXDESIGN: A Community Driven Literature Review Exercise*, illustrating how an international design community might collectively organize and interpret a rapidly expanding body of work. Aditya Johri of George Mason University closed the formal keynote sequence with *Designing the Future of Engineering Education through Artificial Intelligence*, directing attention to the broader educational changes that AI may require. Together, the keynotes emphasized that the consequences of AI in design education will depend not only on the technologies themselves, but also on how educators and institutions choose to use them.

The first two workshop sessions addressed the direct use of AI in design and in design pedagogy. *Innovating Design with AI* examined lessons from students and faculty, the treatment of AI as a new and still imperfect design-team member, and the reasoning processes displayed by generative AI. *AI in Design Pedagogy and Practice* then considered how large language models might supplement novice knowledge, how design requirements could guide the development of educational AI agents, how AI-supported activities might be evaluated using Bloom's taxonomy, and how generative approaches could be incorporated into design-thinking curricula. These sessions made clear that effective classroom integration requires more than simply providing students with access to a new tool.

The third session broadened the discussion from capability to consequence. *Ethics, Empathy, and Equity in AI-Enhanced Design* addressed ethical auditing, cultural and semantic barriers in assistive technology, and the effects of power, privilege, and poverty on design. The discussion emphasized that the consequences of AI-enhanced design cannot be separated from the social, cultural, and economic conditions in which technologies are developed and used.

The fourth session, *AI Tools and Platforms for Student Learning*, explored AI-supported reflection, platforms for managing design learning, approaches intended to maintain critical thinking and higher-order decision making, and the integration of universal design and sustainability. The presentations highlighted the need to evaluate AI-enhanced design education not only by what students can produce, but also by the habits of mind, relationships, and responsibilities that educational practices cultivate.

The final two thematic sessions examined the settings in which AI-supported design learning occurs. *Institutional and Interdisciplinary Partnerships for AI in Design* included work on innovation competitions, complex process analysis, multidisciplinary community-engaged teams, and the use of generative AI in engineering design education in Japan. *Human-Centered Design, Identity, and Belonging* considered collaboration with a large language model to investigate belonging, the influence of co-curricular interventions on engineering identity, and conscientious design in a sustainable engineering project in Hawai'i. These presentations connected AI to the larger educational ecosystems in which students develop as designers and engineers.

The Ideas Marketplace and Collaboration Incubator created additional space for emerging work and new partnerships. Marketplace contributions examined AI interventions in sustainability and social entrepreneurship education, the development of multiple regional design workshops, personality-based team optimization, and role-based prompting to support individual ideation. The Collaboration Incubator invited participants to turn shared questions into prospective joint work. The workshop concluded with a collective session, *MDW XIV*

Wrap-Up: What Have We Learned?, in which participants reflected on the opportunities, cautions, and unresolved questions that had surfaced across the three days.

The papers in this special issue document a field at an early and consequential stage of change. Rather than treating artificial intelligence as a settled collection of tools or practices, the contributions examine competing possibilities for innovation, learning, access, judgment, and responsibility. We hope that the issue will support thoughtful experimentation while also encouraging continued scrutiny of what may be gained, altered, or lost as AI becomes more deeply embedded in engineering design education. I gratefully acknowledge the Center for Design Education, President Nembhard, the workshop organizing committee, keynote speakers, moderators, presenters, and participants whose engagement made MDW XIV possible.

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