

Beyond the hype: Reflections on the implications of AI for urban design education

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Abstract

The emergence of Generative Artificial Intelligence (GenAI) is reshaping Higher Education and professional practice, demanding critical reflection on its implications for Urban Design education. This viewpoint explores how AI challenges educational models and transforms design practice. In higher education, GenAI offers opportunities for personalized learning and innovative teaching, but raises enormous challenges regarding assessment validity, learners' intellectual development, and ethics. Within Urban Design, AI is already being used for tasks such as data analysis, image generation, design generation, and optimization. But AI development and adoption have the potential to further transform design, expanding automation and questioning the role of the designer. Drawing on literature, interviews with UK practitioners, and critical reflection, this viewpoint puts forward some reflections about ways in which urban design education may engage with and respond to the emergence of AI. First, institutions must adopt a critically engaged approach, balancing innovation with caution and ethical responsibility. Second, assessment practices require structural redesign to safeguard learning validity while embracing AI's potential productively. Third, curricula must be updated to integrate critical AI literacy while protecting fundamental design and spatial reasoning skills. Fourth, AI offers potential to enhance teaching and learning. As AI becomes integral to design practice, educators must reimagine pedagogies to ensure graduates are equipped to navigate and shape an AI-augmented urban future. Ultimately, urban design education stands at a crossroads - where the choices made today will determine whether AI enhances or undermines the intellectual and ethical foundations of the discipline.

Keywords: Artificial Intelligence (AI), urban design education, pedagogy, curricula, skills

1. Introduction

In a recent paper, [Costa and Murphy \(2025, p. 3\)](#) argue that “what format Gen-AI motivated changes will take is decisive for the future social role of education. Education can submit itself to technological domination, rationalizing AI skill development as the latest educational and ethical need, as suggested by the Russell group consortium, or instead channel energy into promoting students' intellectual agency.” Indeed, Generative Artificial Intelligence (GenAI) presents profound implications for education, and how it responds will have lasting consequences. In the field of urban design, these challenges are intensified by the fact that AI also has the potential to reshape design practice and professional roles – thereby influencing the teaching of the discipline and the employability of its graduates.

This viewpoint briefly discusses the implications of AI for education and urban design practice and offers reflections on how urban design education can critically engage with and adapt to this evolving technological landscape.

2. AI in Education: A Revolution with Uncertain Outcomes

It is no exaggeration to say that AI is challenging the foundations of higher education. While the use of AI in education (AIEd), for instance, intelligent tutoring systems, has started about three decades ago ([Ouyang & Jiao, 2021](#)), the emergence of widely accessible and user-friendly



Generative AI tools, that can generate text, images, videos, or code made this technology available to many and has much wider implications for teaching and learning.

There is an ongoing—and contested—debate about the impacts of GenAI for education, highlighting both opportunities and challenges. Bozkurt et al. (2024), in their critical manifesto, offer a comprehensive overview of these dynamics. Generative AI promises to increase efficiency, enable personalized learning, support innovative teaching practices, and foster inclusion. Key concerns include academic integrity, bias, inaccuracy and misinformation, impact on learning processes, and ethical issues. They stress that GenAI is *“is far from a neutral tool” and as its use “reshapes education, it risks eroding essential human elements - creativity, critical thinking, and empathy - and could displace meaningful human interactions with algorithmic solutions”* (Bozkurt et al., 2024, p. 488). Research is also investigating responses to AI, for example, regarding assessment design (Corbin, et al., 2025b) and guidelines on GenAI use (Ullah et al., 2024). While there is no consensus on these issues, Costa and Murphy (2025, p. 2) point out the rapid and acritical acceptance of GenAI by Higher Education institutions reflected in their commitment to the new technology and *“little to no resistance to its effects, as big tech companies start to insert GenAI into their search engines and tools.”*

It is, however, crucial to reflect on the impacts of AI on urban design education. Two fundamental issues, in particular, deserve attention:

First, the validity of assessments and the integrity of degrees. GenAI tools challenge assessment validity because they enable students to complete tasks without having the knowledge or skills (Nikolic et al., 2024). Commonly used assessment types, such as essays or reports, are particularly vulnerable. A recent survey (Freeman, 2025) of UK undergraduate students found that 88% use GenAI tools such as ChatGPT, revealing a staggering adoption rate. In response, many institutions have attempted to limit the use of GenAI by defining and communicating how / to what extent it can be used. But Corbin et al. (2025b, p. 1) argue that these discursive approaches only create *“an illusion of assessment security”* and that it is necessary to make *“structural assessment redesign that builds validity into assessment architecture.”* Moreover, GenAI is evolving rapidly, getting better at doing a range of tasks—including design and planning work—and overcoming some of its limitations, broadening the range of assessments that can be done with extensive support from (if not entirely by) these tools.

Second, the impact on student learning, particularly in undermining the acquisition of core competences. As Costa and Murphy (2025, p. 9) argue, GenAI in education *“can have serious consequences for the intellectual development of individuals.”* In fact, reliance on GenAI may lead to bypassing of cognitive activities essential to develop creative and critical thinking, and problem-solving capacities. Moreover, it may hinder the development of critical skills such as writing, analysis, or drawing, and lead to surface—rather than deep—learning. Ultimately, *“GenAI features may give the impression that understanding can happen without thinking, via the production of quick answers”* (Costa & Murphy, 2025, p. 6).

But the impact of AI on pedagogy/education is broader as it is also necessary to consider how these technologies will be used by—and transform—different disciplines and professions.

3. AI in Urban Design Practice and Research

AI is having an impact across many sectors, including the design of the built environment (As et al., 2022). AI tools are already being incorporated in design practitioners' workflows for tasks such as data analysis, image generation, design optimization, and performance simulation (Chaillou, 2025). Scholarship further suggests that AI tools have significant potential to support, augment, or even automate tasks across all stages of urban design practice (El_Tantawy et al., 2024; Huang et al., 2026). Moreover, there is substantial potential for enhancing research, as a recent study on pedestrian behavior in public spaces illustrates (Salazar-Miranda et al., 2025), and supporting public engagement and co-design processes (Guridi et al., 2025).

While there is limited understanding of how practitioners are using AI, a recent survey by the Royal Institute of British Architects (RIBA, 2025) suggests increasing adoption of AI by architectural firms in the UK, with 59% of respondents reporting using AI in their work. However, only 5% of practices use AI on every project, suggesting that adoption is uneven and still emergent. AI is used for tasks related to both the design process and project management, albeit less in the latter. Importantly, the profession sees AI as potentially enhancing their practice, but there are significant concerns regarding future employment and ethical issues.

Although these tools have (for now) limited application and present a range of constraints for professional design practice (Schlickman & Magana-Leon, 2024), and their full impact on urban design remains uncertain, it seems undeniable that these technologies are here to stay and represent a new phase in the integration of digital technologies within the field.

But AI is not simply another digital tool. It encompasses multiple technologies, with applications ranging from design to project management. Moreover, technologies such as Machine Learning are capable of performing autonomous tasks—for instance, generating multiple design options—without being entirely programmed, further expanding design approaches beyond Design by Drawing and Design by Algorithm (parametric design) (Çalışkan et al., 2024) to more curatorial and co-creation forms of Design (Chaillou, 2025; Schlickman & Magana-Leon, 2024).

The integration of AI in urban design practice thus raises critical questions for urban design education, with implications for both pedagogy and curricula development. How is AI going to transform the discipline and the role of the designer? What knowledge and skills do future graduates need to practice in an AI-augmented future in an effective and ethical way? How can students contribute to harnessing the potential of AI for designing better cities and mitigating the risks brought about by this technology?

4. Reflections for Urban Design Education

Researchers are starting to investigate the impact of AI in architectural education (Fagan et al., 2025; Jin et al., 2024; Kee et al., 2024), but less attention has been paid to urban design and planning education (Siu et al., 2025). Drawing on interviews with UK urban design practitioners and desktop research, I offer some speculative and initial reflections on key opportunities, challenges, and possible directions for urban design education in the face of this emerging technology. A central premise here is that AI will, to some extent, become an integral component of urban design practice and of the way students work and engage with education.

4.1. Critical and Cautious Engagement with AI

There are risks in any approach to AI. Total bans or ignoring it risk becoming obsolete as AI becomes more ubiquitous in everyday life, digital tools, and professional practice. Excessive enthusiasm risks being misled by the hype of a—yet to be—transformative technology, the evolution of which is not entirely predetermined and understood. Given the significant risks that AI's development and use carry—for instance, around human agency, accountability, and democratic decision making—it is essential to critically reflect on the impact of these technologies and adopt a critical and cautious approach while engaging with AI.

4.2. Rethinking Assessment

As Fagan (2025, p. 6) explains, “when tasked with responding to an architectural brief, students are now able to generate convincing images, models, diagrams, essays, and code using simple natural language prompts, without knowing or understanding the machination or logic of the process involved.” This shows the extent to which traditional assessment formats, including not just essays but also design projects, which are the backbone of urban design education, are increasingly challenged by the development of AI tools. Institutions need to reflect deeply on the competences that are essential outcomes of learning in urban design degrees, and change/adapt assessments accordingly. Doing nothing puts at risk the integrity and value of Higher Education degrees.

A major challenge is not just to design assessments that are AI secure and policing misuse but also “*navigating the tensions between supporting productive, ethical use and maintaining valid, meaningful assessment*” (Corbin et al., 2025a, p. 2). Indeed, Corbin et al. (2025a) argue that the GenAI-assessment challenge is a wicked problem. Although there are no easy solutions and all approaches also have downsides, possible directions include moving from discursive changes to assessment (simply stating limits to the use of AI) to structural assessment redesign (Corbin et al., 2025b), defining a minimum amount of assessments that safeguard against the use of generative AI (see UCL Laws approach in Veale et al., 2025), and emphasize the assessment of the process, rather than outcome.

4.3. *Safeguarding Skills Development*

A major concern, as discussed above, is the potential negative impact of using AI in the development of key skills. In the context of urban design education, it is essential to further understand not just how it may affect critical thinking, reading, and writing skills, or thinking but also how students develop design thinking and skills. If they can bypass sketching to produce instant images or bypass design elaboration to develop feasible schemes, how will they have the opportunity to think—and learn—through drawing? Learning through designing is also crucial to develop spatial literacy and awareness of scale, and an understanding of what is relevant—or not—in different stages of the design process.

It can be argued that previous computation technologies have already disrupted the engagement of students with the act of drawing. But AI’s capabilities promise to exponentially automate design tasks that are, today, critical for students’ learning. Studio education plays an important role in supporting learners’ engagement with an iterative design and creative process. But further research is needed to understand how AI may impact design skills development.

4.4. *Updating Urban Design Curricula*

Urban design curricula must inevitably adapt to prepare students to practice with AI in and effective and ethical way.

Embedding critical AI literacy is essential. This should include a basic understanding of how AI models work and are trained, the datasets underpinning these, and their many limitations (e.g. bias, inaccuracy, etc.). Ethical issues and wider societal and environmental impacts are also key. Finally, students should have the opportunity to develop practical (and critical) skills in using AI, including general text-generating tools and design-specific tools, such as image generation and eventually, more sophisticated design generation and evaluation.

Before moving into what other skills may be required, it is worth discussing the views of UK-based practitioners. When asked about the skills needed for future practice, several interviewees emphasized the importance of core design skills—particularly an understanding of what constitutes a good place, spatial awareness, and knowledge of key factors such as infrastructure and microclimate. In the words of an interviewee, firms still want a “designer who knows how to design something.” These views underscore the need to think about curricula not only in terms of the AI-related skills required, but also in recognizing that fundamental design skills are still, if not more, relevant; it is thus crucial to keep teaching those, as discussed in the previous point. This will require considerations about ways to promote students’ engagement with real places, drawing, design concepts, and rationale, etc.

Interviewees further highlighted the importance of knowing how to work with AI tools. But there is a sense that much of the technical knowledge can be learned on the job, and emphasis should be placed on students’ understanding of which tools are available, how these can be applied to optimize design practice, and flexibility to adapt to new tools. Some specific skills for digital practice, namely prompting, coding/programming, and statistics, were also mentioned. Courses should thus create opportunities for students to test and explore AI tools in the context of their

design practice, spatial analysis, and research, with a focus on learning how to use AI tools to inform, not restrict their work.

The impact of AI is also visible in urban development, space, and management (e.g., autonomous vehicles). Awareness of these implications and future thinking about how urban environments will need to adapt is desirable.

Given that urban design curricula already include a range of topics (Yavuz Özgür & Çalışkan, 2025), it is challenging—in many programs—to add more content. As such, it is expected that AI will be another theme that will further specialize and diversify urban design education, as institutions choose whether to engage with it minimally or more extensively and experimentally.

4.5. Enhancing Pedagogical Practices

There is a wealth of literature investigating the potential of AI for enhancing teaching and learning (Ouyang & Jiao, 2021). Recent studies are exploring this issue in relation to architectural and urban design education, for example regarding the potential of image generators for enhancing teaching of history of architecture (Fareed et al., 2024), how GenAI may support development of digital literacy and holistic competences (Kee et al., 2024), and how AI can support urban design education, focusing on the various stages of the design process using scaffolding theory (Siu et al., 2025). Key opportunities for urban design education include using AI to further design explorations and creativity; developing competencies in data analysis and evidence-based design; and enhancing the ability of students without a design background to engage with design processes.

5. Conclusion

AI challenges established approaches to design education. Paraphrasing Fagan et al. (2025), while the integration of AI tools into urban design education is an inevitability, its form is not yet predetermined. Urban design schools and educators have a responsibility to engage with these debates and contribute to shaping the future of the field, seeking to strike a difficult balance between innovation and integrity, while maintaining the core mission of educating urban design professionals who are prepared to practice critically and ethically in an uncertain AI-augmented future. This viewpoint aimed to stimulate this debate, inviting readers to reflect on the challenges but also on how to harness AI's opportunities for education and design practice.

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Juliana Martins contributed to all aspects of the study, including conceptualization, methodology, investigation, analysis, and writing – original draft, review & editing.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data will be made available on request.

Ethics Committee Approval

Ethics committee permission is not required.

Resume

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