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Teaching Architecture

Insights from TU Delft – Research on Education Innovation in Architecture & the Built Environment

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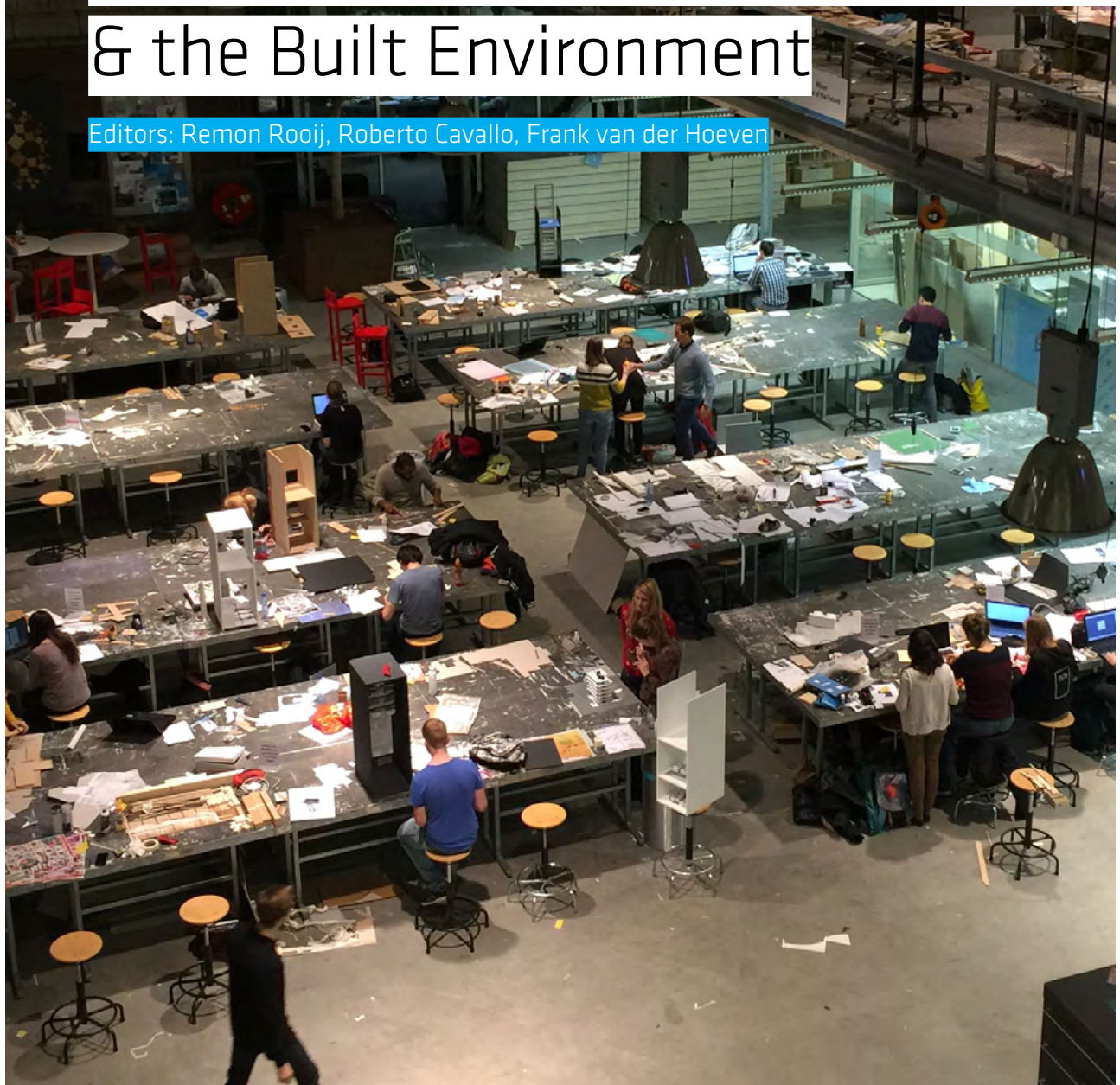
Contextualizing Architecture & the Built Environment Research on Education

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A Glimpse into the European Context

Our disciplinary field is uniquely positioned at the intersection of art, science, engineering, and social responsibility. Architecture in Delft—*Bouwkunde* in Dutch—refers to the disciplines of architectural design, building technology, urbanism, landscape architecture, geomatics, and management in the built environment. According to the European Association for Architectural Education (EAAE, 2022), architecture extends beyond designing buildings and cities; it is a field dedicated to interpreting and shaping the built environment in response to cultural, ethical, and environmental conditions. In this context, professionals must navigate the complexities posed by climate change, globalization, and rapid urbanization simultaneously. Education innovation and pedagogical research are therefore indispensable for preparing future built environment professionals to address these ever-evolving challenges effectively.

The EAAE emphasizes that a solid education foundation should equip students to engage in critical inquiry, cultivate spatial understanding, and develop a capacity for synthesis—skills that are essential for problem-setting and problem-solving in today's multifaceted societal landscapes. While grounded in its own body of knowledge, this inquiry into education should also benefit from interdisciplinary collaboration, integrating insights from other disciplinary fields. To facilitate a broader dialogue on public understanding and policy regarding the built environment, greater cohesion is needed between theoretical research and practice-based inquiry. This will foster collaboration between academia and the profession, contributing to a dynamic and expansive architectural knowledge base.

In this regard, the New European Bauhaus (NEB, 2021) initiative further strengthens the mission of architectural education by promoting an approach that aligns beauty, sustainability, and inclusivity with architectural practice. Rooted in principles of collaboration and societal impact, NEB emphasizes the importance of integrating cultural heritage with forward-looking innovation. This approach calls for a balanced education of built environment students that prioritizes ecological sensitivity, social equity, and aesthetic appreciation. By aligning with NEB principles, architectural education in Europe should prepare students to become not only skilled designers but also changemakers who contribute to more livable, sustainable communities. NEB promotes an education that is both reflective and responsive to the challenges of our time, working to redefine architecture's role within broader environmental and social contexts. The initiative encourages architectural programs to develop curricula that foster critical thinking,

community engagement, and a commitment to ethical practice. In essence, the New European Bauhaus offers an aspirational framework, urging architecture schools to educate graduates who are not only professionals but also responsible stewards of the built environment.

The Design Studio Revisited

Educating architecture and design pedagogies are not new, of course. The pedagogical model of the design studio has been with us for quite some time (Lawson & Dorst, 2009; Van Dooren, 2020). However, the changing, challenging, interdisciplinary, and complex socio-spatial urgencies of today and the rapidly developing design, research, and learning technologies (e.g., XR, AI) position architecture education in continuously changing spotlights. What are the core values of the studio model? Six principles of today's design studio stand out for us:

1   Seeing the (un)built environment as a multiscale, interdisciplinary research object

To intervene wisely, buildings and cities need to be understood from various perspectives simultaneously in terms of time (past-present-future), scale (local-urban-regional-(inter)national), stakeholders (private, public, civil society), and perspectives (spatial, technical, social, economic, political, cultural).

2   Gaining a theoretical understanding of design and improving frame creation

Designers must understand what they do as professionals to convincingly argue their approaches, methods, and processes, and frame their ambitions, concepts, and intervention proposals (Cardoso et al., 2016).

3   Dealing with unpredictability via design

A design is a proposal for a desirable, possible future (De Jong, 2012). A design is a future in the making. Exploring and developing plans for an uncertain future is only partly based on or informed by hard, empirical evidence. It is much more based on interpretations of current situations, design explorations, narratives, imagination, envisioning, and vision and strategy making.

4   Working at and across various spatial and temporal scales by visual thinking

Visualization shows the conditions and effects of design choices through space and time. It is pivotal not only for designers as 'language' (Van Dooren, 2020) to explore and experiment but also for audiences who need to understand, assess, and decide about spatial plans.

5   Exploring the various relations between research and design

Students need to understand the relationship between scientific research and academic design and develop their problem-solving skills for ambiguous contexts. Simply put, one can do research for design, on design, and through design (Rooij & Lousberg, 2022; Nijhuis & De Vries, 2019).

6   Boundary-crossing skills

To realize the spatial integration of diverse bodies of knowledge, continuous communication across disciplinary boundaries and societal positions is needed to recognize, seek, and appreciate friction arising from different perspectives (Fortuin et al., 2020; Leung, 2020).

Design assignments tend to be open-ended, and the design process is not prescribed, leaving freedom of purpose and choice. Students are typically asked to reinterpret their assignment based on thorough research and design experiments, consecutively defining a position and process steps themselves (Van Dooren, 2020). Schön (1983) refers to such a professional as a 'reflective practitioner', who learns via reflection on, in, and for (design) action. This open process comes with many uncertainties and personal challenges for design students. A question might be, how should we guide students in a healthy, challenging way (Rooij & Mooij, 2022)? The role of educators is pivotal.

Educators

There are no simple (design) solutions for complex challenges, and there is also no simple way to teach architecture. Educators' roles vary from experts, specialists, and assessors to coaches, feedback givers, facilitators, and many others. The pedagogical-didactic qualities for educators matter a lot as knowledge about complex and uncertain systems is not 'hard' and 'objective' but socially constructed to a very large extent: in a design-oriented curriculum, the community is the curriculum! Being explicit and self-reflective toward one's teaching practice is a very good starting point for improving education quality and developing one's pedagogical understanding. That is an important value. Educators should critically look at their course design and teaching practice, looking for data, theory, or educational knowledge to support their pedagogical position or methods to scholarly evaluate their teaching practice. And share!

References

Cardoso, C., Badke-Schaub, P., Eris, O. (2016). Inflection moments in design discourse: How questions drive problem framing during idea generation. *Design Studies*, 46(2016): 59-78.

Dooren, E. van (2020). *Anchoring the design process. A framework to make the designerly way of thinking explicit in architectural design education.* Ph.D. thesis. A+BE Architecture and the Built Environment, Delft University of Technology.

EAAE (2022). https://www.eaae.be/about/statutes-and-policypapers/eaae-charter-architectural-research/ retrieved on December 17th, 2024

Fortuin, K.P.J., Post Uiterweer, N.C., Gulikers, J.T.M., Oonk, C, Tho, C.S.W., (2020). Training Students to Cross Boundaries between Disciplines, Cultures, and between University and Society: developing a Boundary Crossing Learning Trajectory, *Annual SEFI conference Engaging Engineering Education,* 20-24 September, Enschede: University Twente.

Jong, T.M. de (2012). *Diversifying environments through design*. Ph.D. Thesis. Delft University of Technology.

Lawson, B. & Dorst, K. (2009). *Design Expertise*. Architectural Press Elsevier: Burlington.

Leung, A. (2020), Boundary crossing pedagogy in STEM education. *International Journal of STEM Education*, 7, 15 (2020).

NEB (2021). https://www.europarl.europa.eu/RegData/etudes/ATAG/2021/689363/EPRS_ATA(2021)689363_EN.pdf, retrieved on December 17th, 2024

Nijhuis, S & De Vries, J (2019). Design as Research in Landscape Architecture. *Landscape Journal*, 38(1-2); 87-103.

Rooij, R. & Lousberg, L. (2020). Ingenieurswetenschappen. In: Hoekstra, MJ, Lousberg, L., Rooij, R., Wilms Floet, W., Zijlstra, S. (eds). *INZICHT. Academische Vaardigheden voor Bouwkundigen _ 2020-2021_Q1.* Faculty of Architecture & the Built Environment, Delft University of Technology.

Rooij, R., Klaassen, R., Cavallo, R., & Arts, J. A. (2019). Architecture and built environment design education: disciplinary and pedagogical developments. *International Journal of Technology and Design Education*, 30 (2020)(5), 837-848.

Rooij, R.M., & Mooij, S.C. (2022). Healthy challenging design education for engineers. In M. S. Gudjonsdottir, & H. Audunsson (Eds.), *Proceedings of the 18th International CDIO Conference 2022* (pp. 778-792). (Proceedings of the International CDIO Conference). CDIO.