

Design Creativity in Architecture and Engineering

Andrew Wodehouse ¹  and Hernan Casakin ^{2,*} 

¹ Department of Design Manufacturing and Engineering Management, Faculty of Engineering, University of Strathclyde, 16 Richmond St, Glasgow G1 1XQ, UK

² School of Architecture, Ariel University, Ariel 44837, Israel

* Correspondence: casakin@ariel.ac.il

Creativity is a fundamental topic of study in design, encompassing the formation of new ideas and insights. As such, creativity is critical to the development of innovative cognitive processes, as well as the development and production of innovative outcomes at the abstract, configurational and detailed levels.

The objective of this Special Issue was therefore to explore how creativity can be characterized and supported throughout design activity in architectural and engineering domains related to construction and built environments. Five core papers were originally published, with contributions from an international spread of researchers, including Lithuania, South Korea, Israel, Australia and the UK. These encompass considerations of social context, visual communication, creative spaces, decision-making and computation support.

Dijokienė, Navickienė, and Riaubienė [1] explored the social and cultural context that has influenced Lithuanian architecture, particularly with respect to the Soviet era. A series of interviews were conducted with nine prominent and influential architects who received their professional education in post-war Lithuania and were actively working in the Soviet period and later, and these interviews revealed important components of the architects' self-awareness. This was characterized by the present conflict in Lithuanian architecture of being an art creator versus a service provider.

Park and Kim [2] focused on the adoption of filmic spaces as a way to stimulate creative thinking in architectural education. They conducted a design studio exercise using elements of film such as movement, frame, montage, light, and color to represent architectural languages. With the strong historical link between architecture and film, this approach shows considerable promise as a tool for enhancing creative thinking and for improving creative design processes.

Lee and Oswald [3] addressed the role of decision-making in design when designers make use of parametric CAD systems. Although parametric design assists in automatically generating and evaluating options, not much is known about decision-making activities in this context. To bridge this research gap, they conducted a protocol analysis of decision-making and identified three key processes during conceptual design—conclusive, confirmative, and simulative. The identification of these processes provides a foundation for the effective deployment of parametric systems in support of the creative design activity.

Gu and Behbahani [4] investigated the area of computational design creativity through a critical review of its use in building environment design. Their study examined a thorough body of literature on the topics of creativity, computational creativity, and their assessment to identify levels of computational creativity. Four areas are identified as being of key relevance: synthesis and analysis (which are well documented) and interfacing and communication (which are less so). In this light, opportunities for future research are presented.

Finally, Casakin and Wodehouse [5] undertook a systematic literature review of design creativity in the architectural design studio, surveying over 700 papers to understand the role it plays in underpinning creative working. Extant research on the most relevant topics in the field in the past ten years was organized under the categories of pedagogy, cognition,



Citation: Wodehouse, A.; Casakin, H. Design Creativity in Architecture and Engineering. *Buildings* **2022**, *12*, 1552. <https://doi.org/10.3390/buildings12101552>

Received: 22 September 2022

Accepted: 26 September 2022

Published: 28 September 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

interaction and socialization, virtual tools, and metrics for assessment. A discussion of these topics was aimed to identifying critical issues and directions for promoting creativity in the architectural design studio.

Together, the five papers illustrate the considerable diversity and vitality of research in creative practices for architecture and engineering. Our understanding of creativity continues to evolve, with findings from other domains such as biology, artificial intelligence, and neuroscience informing new interpretations. Any new approaches will nevertheless require contextualization so that they can support the dynamic nature of activity that characterizes creative behavior. We expect that this combination of review papers and new research will contribute to providing a clearer view of the area and will stimulate future research.

Author Contributions: Conceptualization, A.W. and H.C.; methodology, A.W. and H.C.; formal analysis, A.W. and H.C.; investigation, A.W. and H.C.; writing—original draft preparation, A.W. and H.C.; writing—review and editing, A.W. and H.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Dijokiene, D.; Navickiene, E.; Riaubiene, E. Self-Awareness of Soviet Lithuanian Architects in Their Creative Power and Social Significance. *Buildings* **2022**, *12*, 1. [[CrossRef](#)]
2. Park, E.J.; Kim, M.J. Visual Communication for Students' Creative Thinking in the Design Studio: Translating Filmic Spaces into Spatial Design. *Buildings* **2021**, *11*, 91. [[CrossRef](#)]
3. Lee, J.H.; Ostwald, M.J. Creative Decision-Making Processes in Parametric Design. *Buildings* **2020**, *10*, 242. [[CrossRef](#)]
4. Gu, N.; Behbahani, P.A.A. Critical Review of Computational Creativity in Built Environment Design. *Buildings* **2021**, *11*, 29. [[CrossRef](#)]
5. Casakin, H.; Wodehouse, A. A Systematic Review of Design Creativity in the Architectural Design Studio. *Buildings* **2021**, *11*, 31. [[CrossRef](#)]