Design-Build Projects in Academia

Marco Hemmerling

1 Applied Research as Teaching Method

Digital technologies altered the field of architecture and the architectural profession significantly from design to production. Even though CAD as drawing tool became a standard throughout the last decades, both in architecture schools and practices, there is still a huge potential of computational technology waiting to be activated for architectural production processes. However, to get in-depth understanding of the capability of digital applications, it requires not only time and the ability to operate these tools but foremost a broad expertise in architectural design methodology comprising of Computer-Aided Design (CAD), parametric design strategies, Building Information Modelling (BIM), simulation tools, and digital fabrication technologies plays a significant role in the evolution of contemporary architecture. This situation calls for a redefinition of the architect's education. It requires (future) architects to become familiar with computational processes and to understand the underlying principles. Recognizing the potential of this development, new technologies and applications promise more than just new design possibilities. Above all, it puts the architect back to their central role within the architectural production process, like the building master, being responsible from the initial idea to the completed building. This prospect becomes apparent in many areas of the architectural process through the ability to respond directly to design iterations, by saving time through automation, by increasing economic viability, by reducing the potential sources of error, and through the ability to directly transfer the digital design into physical results by the means of latest CAD/CAM (Computer Aided Manufacturing). Even though CAD-modules are implemented in most of the Bachelor and Master courses in architecture schools, it is just one in between many

M. Hemmerling (✉)
Computational Design in Architecture, Faculty of Architecture,
Cologne University of Applied Sciences, Cologne, Germany
e-mail: marco.hemmerling@th-koeln.de

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other subjects of the whole curriculum. Taking into account the fast development and variety of digital tools and the complexity of their applications on one hand and the demands for a reflective methodology that allows for an intelligent and appropriate design strategy on the other, the need for an in-depth understanding and a mutual integration of this field in the architectural discourse is absolutely mandatory.

Against this background, the second part of the present volume documents a range of academic projects carried out at the Detmold School of Architecture and Interior Architecture, East-Westphalia University of Applied Sciences as well as at the Politecnico di Milano from 2008 to 2017. This chapter collects a compilation of visionary, playful, and experimental ideas that were not only realized by the use of digital tool and computational strategies, but above all, with an approach of encouragement, inspiration, and imagination.

The selected case studies reflect the previously discussed theoretical background and exemplify the various aspects in specific projects—from conceptual design to prototypical building. The projects range from one week workshops to entire academic year modules, carried out on Bachelor-, Master- and Postgraduate-level. The kaleidoscopic documentation showcases not only the results but foremost, tries to delineate the underlying teaching methods and findings throughout the process. As such the case studies should serve as an inspirational source for students, lecturers, and architects and encourage the development and transformation of these concepts. Moreover, the documentation is intended to foster the discussion about the potentials, conditions, and constraints of computational design and construction strategies in architecture.