Reseach Plan

Values in the Making
An Exploration of Tangible Learning Methods in Architectural Education

Max Bernaerts | 4852192
AR3EX115 | Explore Lab 39

Tutors:
Jorge Mejia Hernandez
Mieke Vink

Content

Fascination

The origin of this research and my interest in the values of making comes from some specific experiences I have had before where I was able to witness these values. When I, as a graduate student in architecture myself, look back on these experiences, they make me think about the way we study, and therefore practise architecture. I would like to introduce one of these experiences, which was to me the most profound one, and take this experience as the starting point of the research.

During my exchange in the autumn of 2023, I could participate in some of the activities from the Architecture Lab[1] of professor Yoshiharu Tsukamoto-san at the Tokyo Institute of Technology. The students of this lab engaged in an ongoing project in Kamanuma, a village in the Chiba Prefecture, one hour and a half drive from the centre of Tokyo. The project, referred to as Small Earth, has, in a very preliminary explanation, the goal to reconnect people with their nature (Tsukamoto et al., 2023). It is active in the rural context of what used to be a agricultural village but faced depopulation and got taken over by very rough nature. Both the rice fields, agriculture, and the houses, architecture, stopped receiving their seasonal processes of maintenance as these require a lot of physical labour and maybe more importantly, specific knowledge that is transferred mostly by working together, passing it on from generation to generation. The specific landscape in which this village is located, referred to in Japanese as Satoyama, is the border area between the dense mountainous forest and the flat valley. The term Satoyama also implies the rich history of maintenance processes of this area and the coexisting between nature and humans. In this context, human interventions go hand in hand with natural processes resulting in a livelihood where humans can profit from nature in a sustainable way, without stressing the environment. Coppicing for example, allows the surrounding forests to breathe and encourages new shoots to grow from the stump or roots.

1 — This structure of Labs is similar the structure of graduation studios at the Faculty of Architecture of TU Delft.

The village of Kamanuma is just one example out of many other japanese villages that are threatened in existence by the ageing population and relocation of younger generation towards Japan's ever expanding metropolises. The activities of the Small Earth Association, led by Yoshiki Hayashi-san, aim to invite people form the cities back to the countryside and make them engage in the processes needed for the regeneration of the village (Tsukamoto et al., 2023). Not with the intentions to return our society to the past, or to get stuck in a romanticised version of it, but to learn from nature and these traditional cultures to fuse this way of living with the positive advancements of modern civilization[2]. The main activity was the seasonal maintenance of the rice paddy fields, as the whole Satoyama is built around the cultivation of rice. With the reintroduction of all these activities and the increasing number of participants, the need for functional spaces also arose. Dry places to work, store tools and resources, cook, eat, wash and sleep. These buildings were already present in the village, but they needed major renovation

2 — Making advantage of the technological tools, innovative materials and modern construction methods available to us.

as they had been neglected for a long time. So in parallel with the maintenance of the fields comes the maintenance of the buildings, which requires specific knowledge and craftsmanship, such as thatching roofs, plastering, woodworking and so on, hence the interest of architecture studios to participate in this project.

Professor Tsukamoto's interest in this village stems from its stark contrast to urban life. In his view, life in cities is very convenient, but if you want to pursue something outside of this framework of convenience, you face numerous restrictions—a phenomenon he describes as "the principle of impossibilities". In Kamanuma, however, students find an open environment to experiment collaboratively and practice architecture in a hands-on way—what he refers to as "the principle of possibilities" (Tsukamoto et al., 2023). This contrast became evident to me as well. Unlike the restrictive urban environment of Tokyo, Kamanuma offered us a genuine context in which we could work in a real context with real materials. We quickly realised that materials often resisted our initial design intentions, requiring us to adapt our designs to the material's inherent qualities. This immersive, practical approach to architectural education deeply resonated with me. Initially, I was excited by the prospect of contributing to the village using the theoretical knowledge and design skills learned in school over the years. However, working here led me to an unexpected insight: the knowledge and skills we gained in school felt surprisingly abstract compared to the hands-on, practical work we were doing here in this real-life context.

← Making advantage of the technological tools, innovative materials and modern construction methods available to us.

Problem statement

I would like to introduce the problem statement by the aid of a still from the movie Playtime (Fig. 1) of Jacques Tati. Although being a provocational, fictional movie. This still shows in a exaggerated yet at the same time eerily close to reality way how modernisation has brought structure and efficiency on the one hand but on the other hand it brought abstraction and alienation from our reality. More specifically in the field of architecture, this abstraction of our practice was beautifully exemplified in another movie I recently watched in which we follow a material, in this case marble, from the extraction of its origin to its application in a building. An assistant at the architectural firm REX in New York City works behind a double monitor setup[3]. On one screen she has a complicated excel sheet opened with columns and rows filled out with product labels and numbers, on the other she is working on an InDesign file in which she has set up a rigid grid composed out of many small tiles (Fig. 2). At the scale of the screen, the collage she creates looks like a pixelated image, but looking closer, we realise that all the pixels in the screen are actually pieces of marble, carefully sorted and joined so that the veins of the marble all line up to constitute this mirrored effect, like the walls in Mies van der Rohe's Barcelona Pavilion, but at a scale of a thousand. After this realisation, it becomes clear she is designing the facades of the Perelman Performing Arts Center, a cube-shaped theatre building that is the final piece of the master plan for the rebuilding of the World Trade Center. While this building has no further relevance to the subject of this research plan, its design process serves as the exact embodiment of what could be seen as the problem statement of my research. How did we manage to design in this way? How did we manage that an architect, working from the US, is able to collage parts of marble, quarried in southern Portugal, cut, polished and scanned into digital images in France, glued onto glass and assembled into prefabricated steel façade elements in Germany, without even once having touched the actual material?

3 — This is an excerpt from Laurian Ghinitioiu and Arata Mori's documentary 'Veins', which was screened at the last Architecture Film Festival in Rotterdam.

To clarify this further, I would like to use a diagram (Fig. 3) that illustrates that as a society during the industrialisation process, we moved from a small-scale ethnographic network to a global-scale industrial society network. 'Ethnographic network' refers to social networks organised around close face-to-face relationships based on trust. Cultural heritage, and embedded collective knowledge are passed down through generations. People within an ethnographic network may be interdependent but also serve each other in a variety of ways, such as for shared resources. An industrial society network, on the other hand, is usually organised around hierarchical systems of a large-scale, modern society. These networks are often less personal and more structured, designed to support the efficiency and specialisation needed in industrial economies. Knowledge is often codified, standardised, and disseminated through formal channels like for example education. Despite the many advancements this shift brought, it also led to a distorted relationship with our resources, including skills and knowledge. We have become less aware—and less concerned—about their origins, as long as they remain accessible,

Fig. 1 — Playtime (Jacques Tati, 1967)

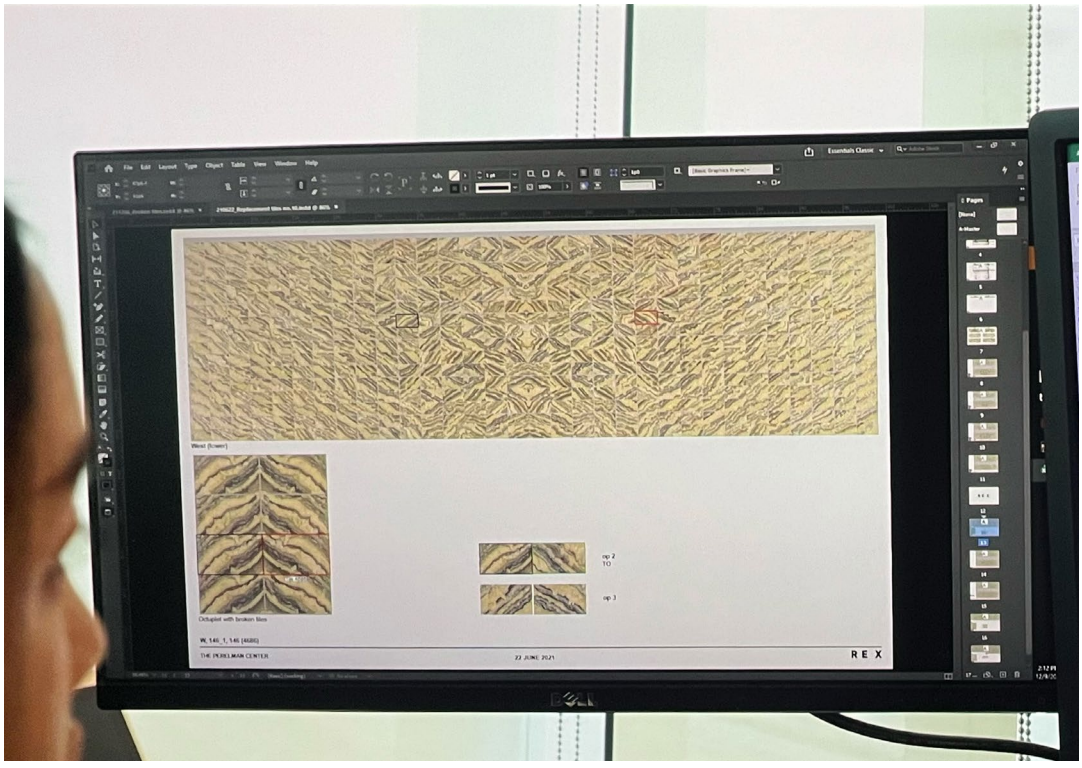


Fig. 2 — Veins (Laurian Ghinitoiu, Arata Mori, 2023)

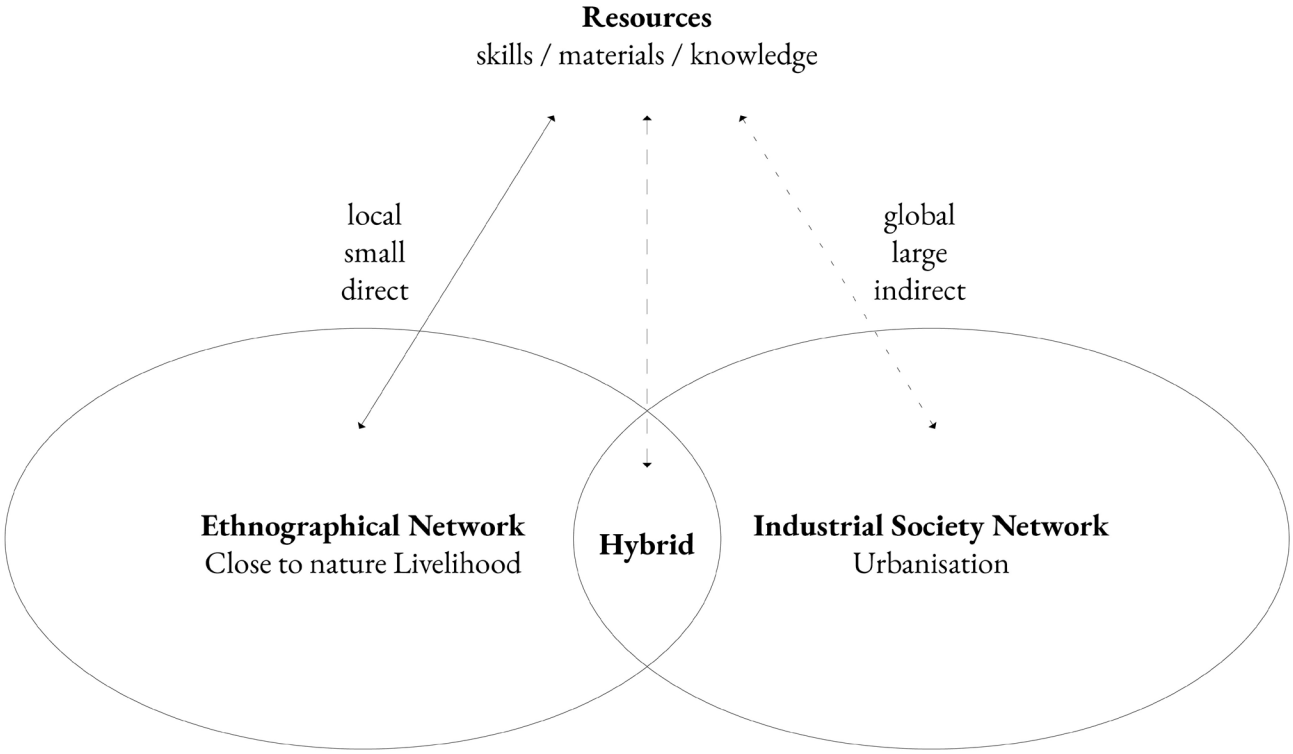
resulting in a disconnection from our material reality and a growing dependence on external services to access these resources[4].

Looking back to the scheme, we can place the 'Hybrid' in the intersection of both the Ethnographic network and the Industrial Society Network. This hybrid resonates with the idea of Yoshiki Hayashi-san earlier mentioned; making use of the advantages of the Industrial Society Network but operating in a direct way, situated in a local context. Although this is a broader social movement, it is very applicable to the field of architecture. This brings us to the much-discussed topic of the role of the architect. What do architects do? Is it merely the conception of, let's say, a building? Is it only thinking of what that building could be and then finding ways to communicate it to others? As Robin Evans puts it in his text Translation from Drawing to Building, there is the "disadvantage under which architects labour, never working directly with the object of their thought, always working at through some intervening medium, almost always the drawing" (Evans, 1986). We could apply this perspective to the way many architectural firms work today, and at the same time even to the way much of our education is organised. Although many efforts are made to develop deeper ways of understanding the context we design for, the process often ends as soon as the drawings are ready for presentation or sent to the contractor. From then on, architects are rarely involved in the actual construction. I acknowledge that this is a strong generalisation of the architectural practice, but it clarifies what I see as a major gap in contemporary architectural education - and ultimately in professional practice: it is disconnected from reality, taught within the safe confines of an office surrounded by screens and books, removed from the tactile experience of building.

As with any social movement, there is always a countermovement, and so too in architecture there is a trend of practices breaking away from abstraction and aiming towards a more hands-on approach, exchanging drawing tools for construction tools and getting involved in the construction site. We see that "making is under growing scrutiny in the field of architecture", and that some practices are organising themselves in a way that allows them to participate in the building site and "get involved in the production, transformation or assembly of building elements and materials" (Lefebvre, 2011). It is this trend I want to profit from and use the collective 'energy' it evokes to think critically about the way we practise architecture today, and consequently, and to me personally more importantly, the way we teach or are being taught to practise architecture.

To conclude, the problem I see is the abstraction en theorisation of the architectural practice, moving away from the material reality in which we work as architects, but also live as human beings. This shift echoes broader changes initiated by the Industrial Revolution, which drove globalisation and reshaped the building industry into an efficient, 'one-size-fits-all' model. In contrast, I advocate for a more situated approach to architecture—one that is hands-on and grounded in material engagement.

4 — This notion is again clearly visible in the project of the previously mentioned Perelman Performing Arts Center.



(Tsukamoto et al., 2023)

Research question

Building on the concept of a school as a place where educational experiences can influence our future professional positions, I plan to focus my research on the learning environment itself, specifically, the added value of hands-on learning methods in architectural education. As for now this question is formulated as follows:

How can the architectural learning environment encourage hands-on learning to improve students' practical knowledge of materials and bridge the gap between the conceptuality of academic schooling and the physicality of the architectural practice?

This question can be divided into three parts. First is the main topic, "hands-on learning," which I aim to explore to understand how alternative learning methods might enrich the existing academic framework of architectural education. The second part addresses the goal: enhancing practical knowledge of materials to bridge the gap between conceptual academic education and the physical, material world. Finally, there is the setting in which I believe this approach should be implemented—the architectural learning environment.

Although it is not directly present in the research question, my aim with the research is also to show the value there is in the activity of making.


5
6

Methodology

As this research focuses on hands-on learning, I want to integrate this physicality directly into the research methodology. To achieve this, I will explore three interconnected fields that span the theoretical-practical spectrum: Pedagogies, Workshops and Practices. Although these fields may initially appear distinct, the aim is to uncover overlapping fields and ultimately establish links that reveal their entanglement.

Pedagogies

To understand previous applications of hands-on learning methods, I plan to examine several case studies, spanning from historic hands-on pedagogical programs to contemporary examples. One notable example is the Yale Building Project, initiated by Charles Moore in 1967 and still active today. This program was innovative for formal architectural training, emphasising that students should learn construction early in their studies—not through traditional classes alone, but by collaboratively designing and building a structure in a yearlong, immersive exercise. Another valuable example is Les Grands Ateliers, where architecture students from across France expand their material knowledge through full-scale building exercises, gaining direct, practical experience. This part of the research will take the form of comparison of the different case studies by means of literature review and optionally visits or interviews with the organisers or participants.

Workshops

To expand my own material knowledge, my goal is to participate in several building workshops throughout the research period. Each workshop will focus on a specific material, such as clay, wood, or steel. As a tangible record of the insights gained from these experiences, I plan to create physical artefacts in the vedute format (7 x 32 x 44 cm), building an archive of my material explorations.

Practices

As previously mentioned, certain architectural practices are redefining the role of the architect by operating within a ‘hybrid’ approach. These practices are moving beyond the traditional role of design-only architects, engaging more directly in the processes of making and construction. I believe there is substantial value in gathering insights from these practitioners, as their experiences and knowledge offer a nuanced perspective on the intersection of design and making. This research will be conducted in the form of interviews, gathering the voices of these practitioners.

encourage **hands-on learning** to improve students' practical **material knowledge**

Tim Ingold
Beatriz Colomina
—
Learning By Doing,
Design-Build pedagogy,
Tacit Knowledge

Pauline Lefebvre
Richard Sennett
—
New Materialism ⟷ Hylomorphism

Learning how to determine **values in the making**

Pedagogies	**Workshops**	**Practices**
Yale Building project	*Craftsmen*	*BC Architecture*
Ronda, PUCV	*Visiting School*	*Material Cultures*
Les Grands Ateliers	*BC studies*	*Paulien Bremmer*
—	—	—
Design-build	*Steel, wood,*	*Role of the architect*
Collective practice	*clay, earth,*	*Material knowledge*
Learning by doing	*...*	*Construction site*
↓	↓	↓
Case studies	Objects	Voices

Understanding **the value in the making** and how to integrate it into **architectural learning environment**

research paper

project

Hypothesis / Expected Outcome

Current architectural education prioritises conceptual learning in controlled, abstract environments, often detached from the physical realities and complexities of materials. Yet, to be effective designers in practice, architects need a deep, hands-on understanding of materials—their textures, limitations, and responses to natural forces. Without this foundational knowledge, how can we truly design well?

I propose that the educational environment is the ideal place to begin developing this material awareness. By engaging directly with materials—working with them, shaping them, and responding to their inherent properties—students can gain practical insights that complement theoretical knowledge. This hands-on approach to learning bridges the gap between academic conceptualization and the physicality of architectural practice. Materials possess embedded knowledge that only becomes fully accessible through tactile engagement and experimentation. This hands-on exploration reveals qualities that scale models whether physical or digital, cannot capture: how materials age, interact with weather, and integrate with other materials and methods. Understanding these aspects prepares students to adapt their designs to the demands and resistances of real-world materials—an essential skill for practice.

By the end of this research, I aim to demonstrate the value of integrating making into architectural education. Rather than critique the current curriculum, my goal is to show how hands-on, material-based learning can enrich the academic foundation, adding a dimension of practical knowledge that is indispensable in bridging theory and practice, bringing together the skilled and the learned.

← Signs of making activities in the Faculty of Architecture of TU Delft, trying to fit it.

Learning By Doing

John Dewey's concept of *learning by doing* emphasises the idea that people learn best through direct experiences and active engagement, rather than through passive instruction. Dewey argued that education should not merely be about transmitting information from teacher to student; instead, it should involve hands-on activities that allow learners to apply their knowledge in real-world contexts. Dewey believed that knowledge isn't just an abstract collection of facts but rather something that gains meaning when connected to lived experience. This experi(m)ential learning model helps to bridge the gap between theoretical concepts and practical application, fostering a deeper understanding of the material that goes beyond mere memorisation.

For architecture, in particular, learning by doing could mean engaging with real materials, design processes, and hands-on construction experiences. This approach could help architecture students understand the nuances and embedded knowledge that only come through direct interaction with the physical aspects of architectural practice.

Design-Built Pedagogies

Design-build pedagogies are educational approaches in architecture and related fields that integrate the design and construction processes into a single, experiential learning cycle. These pedagogies emphasise hands-on, collaborative projects where students not only create designs but also physically build them. Through this process, students gain a practical, holistic understanding of the entire (life)cycle of a project, from concept development and material selection to construction and implementation. In a typical design-build project, students engage directly with materials, construction techniques, and structural challenges, providing them with a realistic understanding of the implications of their design choices. This experience helps bridge the gap between theory and practice, encouraging students to apply design principles in a way that addresses real-world constraints, such as budget, site conditions, and material properties. Design-build pedagogies also promote collectiveness, teamwork, as projects are often collaborative and involve working with other students, faculty, or even community stakeholders. This collaboration fosters skills in communication, problem-solving, and adaptability—qualities crucial for the complex, interdisciplinary nature of architectural practice.

In essence, design-build pedagogy aligns well with John Dewey's *learning by doing*, as it immerses students in the lived reality of architectural practice. By connecting theoretical knowledge with hands-on building, students develop a deeper understanding of architecture that is grounded in real, tangible experience.

New Materialism

New materialism in architecture is an approach that focuses on understanding materials as dynamic, active agents in the design process, rather than as static or passive elements simply shaped by human intentions. Rooted in philosophical ideas from thinkers like Gilles Deleuze, Manuel DeLanda, and Jane Bennett, new materialism views materials as having their own properties, histories, and interactions that play a critical role in shaping a built environment. This approach moves away from seeing materials as mere tools or resources, and instead emphasises the agency of materials—acknowledging that materials can influence design decisions, construction processes, and spatial experiences.

In practice, new materialism in architecture leads designers to consider how materials behave over time, how they interact with their surroundings, and how they impact human and non-human elements within an ecosystem. For example, architects might study how wood changes when exposed to different environmental conditions, how concrete might encourage moss or lichen growth in a humid environment, or how metals weather in an urban setting. This perspective encourages a collaborative relationship between designers and materials, where the qualities and behaviours of materials are integrated into the design rather than being controlled or hidden away/ masked. (Coole and Frost 2010, Bennett 2010)

Hylomorphism

Hylomorphism in architecture is a concept derived from Aristotle's philosophy, where it describes the relationship between *matter (hyle)* and *form (morphe)*. In traditional hylomorphic thinking, matter is seen as a passive substance shaped by an external form-giving force. Applied to architecture, hylomorphism describes a framework where materials are shaped according to a designer's intentions, emphasising the designer's role as the primary creator who imposes order and structure onto passive materials.

In a conventional hylomorphic approach, the architect determines the form and function of a building, then selects and directs materials to fulfil this vision. This perspective tends to prioritise the ideal design concept over the inherent characteristics of the materials, which are seen as secondary to the final form. Hylomorphic architecture often focuses on precision, standardisation, and control, with the belief that materials should be moulded or manipulated to achieve a predefined aesthetic or structural outcome. However, there is a critique to the limitations of hylomorphism, arguing that it disregards the agency of materials and treats them as inert rather than as active participants in the design process. This critique aligns with new materialism, which, as discussed, posits that materials themselves possess certain properties, tendencies, and behaviours that should be acknowledged and integrated into the design.

Bibliography

Andrade Castro, O. (2021). *Ronda: Architectural education and practice from the construction of a milieu in common The PUCV School of Architecture and Design and Ciudad Abierta, Chile* [Dissertation (TU Delft), Delft University of Technology]. A+BE | Architecture and the Built Environment.

Bolt, B., & Barrett, E. (2013). *Carnal knowledge: Towards a "New Materialism" Through The Arts*. I.B. Tauris.

Colomina, B., Galán, I. G., Kotsioris, E., & Meister, A. (Eds.). (2022). *Radical pedagogies*. MIT Press.

Florian, M. (2024, July 23). *Clad in translucent marble slabs, the Perelman Performing Arts Center opens in New York's Ground Zero*. ArchDaily. https://www.archdaily.com/1007034/clad-in-translucent-marble-slabs-the-perelman-performing-arts-center-opens-in-new-yorks-ground-zero

Lefebvre, P. (2018). *BC Architects & Studies. The Act of Building.* Biennale Architectura 2018.

Lefebvre, P., Neuwels, J., & Possoz, J.-P. (2021). *Penser-faire: quand les architectes se mêlent de construction ; Thinking-making : when architects engage in construction.*

Pallasmaa, J. (2009). *The Thinking Hand: Existential and Embodied Wisdom in Architecture*. Wiley.

Tsukamoto, Y., Chiba, C., Kuan, S., & Tane, T. (2023). *How is Life? - Designing for Our Earth.* TOTO Publishing.

Voet, C., Schreurs, E., & Thomas, H. (Eds.). (2022). *The hybrid practitioner: Building, Teaching, Researching Architecture.* Leuven University Press.