

CHAPTER V  
DISCUSSION AND CONCLUSION:  
CONSTRUCTING DESIGN DIALOGUES BETWEEN THE PROCESS OF  
DESIGN AND RESEARCH IN ARCHITECTURE

1. Discussion: Functionalities of Research as Bridging, Understanding, Framing, and Formulating Design

What forms of design dialogues do make research in conjunction with the design process? This main question leads to an examination inclusive of research collaboration with architectural-design inquiry. Design and research convey different modes of thinking as to Groat and Wang (2002): design manifests itself as formal synthesis while research employs logical analysis.<sup>1</sup> Design research can be yet incorporated into the architectural-design process in sequence if designers recognize design activity as a creative, learning inquiry of a series of framing and solving design problems as “research through design.”

Design thinking in the *co-development of problems-solutions* framework offers operative spaces of design inquiry, namely *research space*, for creative platforms of data processing in integration with design understanding and exploration. As investigative domains, design research functions as a *bridge* between problem space and solution space within the overall design space. As Dorst and Cross (2001) propose the design process for creativity continued in “co-evolution of problem-solution,”<sup>2</sup> in which “design space” is enhanced in matching problem and solution spaces, investigative operations to transform an initial knowledge state to a decision domain of potentially proposed design implementation are required. Research space as embedded into a series of problem-solution pairing thus performs as an interval domain of design investigation, and turns into significant design modes to transform design problems to solutions. Research space determines design decisions of solution space, which in turn affect the further problem refinement in the concrete way. Research space is simply defined as *bridging* domains of designing, in which design dialogues of spatial thinking, visual expression, and factual assimilation take place, among a series of the problem-solution evolution. Research space, as a result, lies in the critical performance lending itself to *understanding, framing, formulating design* through searching relevant data, organizing and incorporating information into concepts, and experimenting configuration throughout a progressive series of problem-solution pairs within the design process.

How do designers make a design framework of the problem-solution pairing? As observed, designers begin with design assignments as an initial problem even though their assignments are not “real” design problems. To insightfully comprehend “hidden design hints” in assignments proves important for the designers to search for clustering relevant data capable of establishing a project goal. In this vein, design research in architecture takes up a crucial role of *understanding* problem-structuring: programmatic relationships, site conditions, and design interests. The initial problem-solution pairing arises from an intense investigation to gain an insight into design agendas and goals as primarily tangible rationale as possible.

What possible the problem-solution pairing and design research taking in action become resourceful to shape the design problem furthermore depends upon designers’ worldviews incorporated into design research. Apparently, the designers have initial design visions to organize data processing and clustering with design challenges: programming, sustainability, spatial typology, or tectonics, as observed. Design research in corporation with a design challenge enables designers for *framing* the key design problem, the project’s concept, or design goals in a simple form of the conceptual construct. In this progress, a broad image of design is constructed as an embodied conjecture from which designers set operational design methods. Research for framing insights into the design assignment and program is essential for systematizing a design framework, as Augustin and Coleman note,<sup>3</sup> in which a problem-solution pairing is structured.

In physical design phases, a design framework of a series of problem-solution pairing continues in the design process in more concrete approaches. Due to formal inquiry, design research collaborating with design challenges performs as exploring design possibilities as *formulating* design conjectures and proposal. Design tools and techniques are significant to function with research in this stage. Suitable application of design tools allows designers to process pertinently external information into devising design schemes as well as to communicate prospective images of design with designers themselves. Research on spatial and tectonic forms including external data processing gives rise to (re)evaluating alternatives and refining design development toward the design proposal responsive to the goals.

An emerging, theoretical concept of research space functioning as *bridging, understanding, framing, and formulating design* lies in collaboration with the architectural-design process in the framework of creative learning, dialectic of finding and solving problems. Research collaboration with design can be in progress if design activity is understood as an investigation of the pragmatic design statement.

## 2. Conclusion: Research Realization into the Design Process

The architectural-design process is a complex activity toward the environmental creation—an action inquiry between problem finding and solving. The pairing of problem space and solution space enables “research space” to be incorporated into design space. In other words, design research is able to integrate with the design process in a framework of the *co-development of problems-solutions*. Design thinking of developing a series of the design problem and solution relationships in design activity could make a designer to carry out collaborative research possible for both refining design problems and developing a comprehensive design proposal.

Design research cooperative with the process of design operates as investigative modes including abilities of associative interpretation of relevant knowledge to problems so that decisive solutions can be made. In realms of the architectural-design inquiry, research space plays the role of “operational bridging” within design space to transform design problems toward solutions. Research space functions as framing design problems and goals, exploring design potentials, and examining architectural clarity in collaboration with the process of design development, respectively. The acceptable design is apparently congruent to the progressive development among a series of problems-solutions through which design research facilitates framing a design framework from an intangible concept to a comprehensive level of the environmental creation.

Standing as a discipline of the environmental creation, architectural design is contingent to design methodology in the way that the process of design and research need to be collaborative so as to reinforce design frameworks and creative solutions. Design research incorporating design challenges, moreover, becomes pivotal to direct problem-framing and working design methods as much as design tools are required to synchronize intuitive ideas and empirical data into the coherent form. This study therefore proposes that design research can validly integrate with the architectural-design process as “strategic, creative mechanism” in the advance of architectural design.

## 3. Implication: Design as a Critical Learning Process

To effectively implement research into the design process, a designer could consider design activity as the “critical learning process” toward the design proposal.

Designing as the critical learning process indicates that design situations are continuously developed as long as design inquiry makes a progressive attempt to determine problem finding and solving. The critical learning process of design is

similar to what Lawson proposes that the design process is the development of bonding cumulative demands into a synthetic solution.<sup>4</sup> In architectural-design pedagogy, research in collaboration with design inquiry could be thus articulated in terms of the learning process for environmental creativity. The study suggests design thinking in the framework of the co-development of problems-solutions lending research space to the design process that simultaneously develops design solutions and refine problem-framing. Systemic understanding of the collaborative design-research framework is essential to the architectural-design methodology.

As generating new platforms of environmental design by way of integrating searched information with design ideas, design research lies not in the way to add data on design, but operates as modes of assimilating external information into design challenges and investigations, methodically. In this view, design research always cooperates with design methods and tools for transforming external inputs into designing. Design methods and tools allow a designer for simultaneously comprehending contexts and thinking in design considerations other than communication. Implementation of design methods and tools could be thus introduced in architectural-design studios and pedagogy, correlating with design research. Because design research takes actions when design problems are formed, practices of problem structuring and framing have to be emphasized on design inquiry. This will allows design research roles to interdependently collaborate with problem-framing and operational design methods into the design process.

#### **4. Future Research**

This study is the beginning of the examination of research collaboration with the design process. It looks forward to challenges to insightfully extend paradigms of the design-research relationship. As research results of “design challenges to research” from different subject participants are open-ended, an examination of the design process and research from different contexts might develop and verify the theoretical stance of design inquiry

Rather than determination of research collaboration with the design process, this inquiry indicates that research space is connected to problem structuring and framing as well as design methods. The question proposed here is what possible problem-structuring is associated with design methods through research space. This examination will be worthwhile to enhance knowledge of the architectural-design inquiry and methodology.

## 5. Notes

1. Linda Groat and David Wang, *Architectural Research Methods* (US: John Wiley & Sons, 2002), pp. 105-6.
2. Kees Dorst and Nigel Cross. "Creativity in the Design Process: Co-Evolution of Problem-Solution," *Design Studies*, Vol. 22, No. 5 (2001): 425-37.
3. Sally Augustin and Cindy Coleman, *The Designer's Guide to Doing Research: Applying Knowledge to Inform Design* (US: John Wiley & Sons), 2012, p. xxvii.
4. See Bryan Lawson, *How Designers Think: The Design Process Demystified*, 4<sup>th</sup> ed. (Hungary: Architectural Press), 2006.