

CHAPTER I

INTRODUCTION: SIGNIFICANCE AND PROBLEMS OF ARCHITECTURAL-DESIGN PROCESS AND RESERCH FOR CREATIVITY

1. Design Process and Research for Architectural Creativity

"[Design] as research.....seeks to subsume a reality that is inherently nonpropositional (generative design as a mode of art production) under the domain of propositional activity (analytical research), which raises logical difficulties."¹

Groat and Wang

If architecture continues its future as the design discipline on its own, architectural design must be established as a body of methodology, an objective inquiry of environmental forms. Processes of architectural design as a series of design actions require that design research considered as an impetus for constructing ideas² enable to develop a systematic approach toward creative design production, that is, not solely dependent on cognitive intelligence or creative talent. Design creativity, in this respect, is driven by constructive synthesis of the future solution and analysis of critical possibilities.

This research is based upon the assumption that "design as research" is a generative inquiry including design problems of motivation as well as creative and evaluative processes³ that lead to a resolved product. The relationships between design and research interweave each other in the complex way of design thinking within creative inquiry. If architectural design lies in an inclusive investigation toward critical creativity of the environmental form, architectural creativity is essentially pertinent to the design process and research. Based upon design thinking, design research as investigative procedures cannot be distinctively taken apart from the process of architectural design that speculates an objectively physical form, but plays a collaborative role in any stages of design processes and creativity.⁴ Architectural creativity thus manifests itself as a *design inquiry* cooperating with collaborative means between analysis and synthesis, both of which require "bridging layers" or "design dialogues" to link within the processes toward the ends of environmental products.

However, there is an ideological conflict between architectural designing that holds synthesis or a solution-focused strategy to generate an appropriate outcome and research that mainly depends on logical reasoning.⁵ The nature of the design

process collaborating with research has barely been addressed in architectural theory and design education, especially conciliating *dialectical modes* of design thinking. As a scientific paradigm of positivism of *analysis/synthesis/evaluation* has fallen down to embrace the intrinsic nature of design thinking and pragmatic realms, this research aims to investigate a “design-research” paradigm on a *constructivism* stance so as to generate new insights of how design research exists in design processes in architecture.

2. Terminology and Definitions

2.1 Design as Research

As quoted from Groat and Wang at the beginning of the chapter, the term “design as research” refers to the aims to generate figural reality in parallel with employing propositional methods or schematic activities of analysis, which involve in the design process to culminate into a project-specific solution. Design as research acknowledges that a designer’s experiences, intuitions, and insights play important roles in proposing design responses as well as it integrates design inquiry with a methodology so as to review design developments in the processes.⁶

In this light, design as research lends itself to design inquiry with exploring new information for design tasks, investigating design issues, and experimenting new ideas in order to shape the critical form of solutions. It enhances a designer’s thinking and knowing from preconceived ideas and imagination toward more concretely defined concepts and design decision-making based on objective knowledge and principles.⁷ Design as research is therefore an evolving process, which contains constructive and investigative frameworks coming into comprehensively and systematically reasoning a design solution.

2.2 Design Process

In architectural design, the design process turns to be a fundamental procedure in practice to create environmental forms, the way that designers continue a series of steps, actions, or phases from which design tasks are established toward making the acceptable product. Design processes toward solutions are critically different from problem-solving in general. As Lawson notes in his research on design activity, architects make an attempt to figure out design problems by synthesis as “solution-focused strategy;” on the other hand, scientists focus on systematically studying the problem and discovering the possible regulation through analysis.⁸ Generally speaking, designing is the constructive process in the nature that design problems

are contained within a conjectured solution, which a designer develops it into a concrete image.

Although each designer carries on different design strategies dependent on concentrated inquiries, he/she is engaged with a structural process of design in common. Architectural designers first begin with designating and tackling design problems that are “ill-defined, ill-structured, or wicked.”⁹ *Wicked problems* generate a design framework of the project so that designers continue their solution-focused strategy. In this sense, designers create a conjectured solution that problems can be included within the framework and the bounds of possibility. A *conjecture* in architecture indicates an evocative mode of operating diverse information mandatory for design which influences the design process and inquiry.¹⁰ Moreover, architectural designers are inclined to pursue a *primary generator* so as to define a clear image of the critical problem and recommend its possible solution.¹¹ After obtaining a better understanding of the design task, designers are committed themselves to develop the solution(s) from a suggestive image into a more physical sense of preliminary design toward the detail design for constructing the built environment in reality as Goel proposes.¹²

During the process, designers will get more confident when challenged with relevant facts and factors about the project; therefore, the design problems and ideas must be redefined in order to revise an acceptable solution and to refuse irresponsible alternatives. The design process is thus not a straightforward procedure but an evolving practice along the act of environmental creation.

2.3 Creativity in Architecture

The term “creativity” attaches to architecture because architectural design as generating the built environment for the future possibilities needs to construct new physical reality responsive to specific requirements: users, a variety of activities, the site, and contexts. In this context, creativity in architecture turns to be skill-building of solving imposed problems which embodies the ability of imagery visualization and making of the unexpectedly solution of the environment.¹³

Creativity, in turn, denotes a process rather than cognitive intelligence as it is a matter of progressions to find not only originality but also an appropriate resolution. Creativity in architecture turns to be integrative performances to process design inquiry, to think of problems, to make conscious effort at solutions, to view images, and to develop an evolving idea fulfilling the conditions put on it,¹⁴ thereby

contributing architecture to be active-based values. In this way, inclusive modes of the design process and inquiry are prerequisite to architectural creativity.

3. The Problem of Architectural Design and Research

In architectural creativity, the design process is comprised of several activities that allow an environmental designer to generate resolved design. Design processes embrace mainly dual courses of different actions; first, *analysis* for researching information and alternatives to solve design problems; and second, *synthesis* to create an appropriately innovative architectural product responsive to established design tasks. However, the design process in architecture integrating with research has not been critically examined in terms of reciprocal dialectic of the relationships driving objective creativity.

Rather than dependence upon a designer's prejudiced idea, design research becomes critical constituents of the process in order to concretize design creativity. Positivist design research has made an attempt to search for logical characteristics of the design process that consists of a series of determined scientific procedures, as called *analysis/synthesis/evaluation* model: this deductive design methodology is opposed to architects' design thinking of the solution-based orientation. In this respect, analytical research has been recognized in the design process, but the relationship between processes of analysis and synthesis in design has not been critically concerned and examined. In other words, design research within the process and generative design have yet still disintegrated as the systemic whole so as to reinforce clarity of design problems, decision-making, and creative inquiry in architecture, particularly in architectural design education. Therefore, the position of this research aims to explore and analyze the possibility of cooperative modes of design-research dialectic in the architectural-design process.

4. The Significance of the Research

This research expects to make a contribution in two levels of design knowledge: theoretical and pragmatic aspects of the architectural-design process. The insightful understanding of the integrative process and design thinking will comprehensively collaborate with the creative-making inquiry of environmental forms as an objectively critical investigation rather than prejudiced-driving design. Design processes of investigative analysis and generative synthesis of the design solution will not be isolated through a means of dialectic cooperation, especially in architectural education.

This inquiry of research collaboration with the design process will moreover enhance constructive design-thinking process that will be beneficial to design pedagogy and professions in architecture and related fields: landscape architecture and urban design so as to incorporate design thinking, analytical research, and generative design as the systemic whole of the design inquiry.

5. Objectives of Inquiry

This research aims to examine the relationships between processes of design and research as the dialectical process in architectural design. Its goal is to develop a theoretical proposition of the integrative design process and research. The research thus continues on investigating *design as research* as the following purposes:

1. To examine the relationship between the process of design and design research in architecture
2. To compare and assess integrative design and research within the processes between architectural-design education and professional practice
3. To identify the cooperative possibility between design research and the architectural-design process.

6. Limitation of Study

This research aims not to seek out the nature of the designer's "black box" of how design ideas emerge, but intends to examine how design research collaborates with the process of design in creating an architectural-design solution. Indeed, the inquiry chiefly focuses on investigating a means of the interactive processes between investigative modes and generative-making in architectural design, rather than an emphasis on the ends of the design solutions. The research framework is confined to the design process from architectural programming, problem definition, conceptual generation, design development toward the making of design proposal. Due to emphasis on inquiries of the generative process, the research also accentuates less the designer's employment of design methods than design strategies and thoughts.

7. Notes

1. Linda Groat and David Wang, *Architectural Research Methods* (US: John Wiley & Sons, 2002), pp. 105-6.
2. Sam Miller, *Design Process: A Primer for Architectural and Interior Design* (US: Van Nostrand Reinhold, 1995), p. v.

3. Peter Jan Stappers, "Doing Design as Part of Doing Research" *Design Research Now*, edited by Ralf Michel (Germany: Birkhauser Verlag AG, 2007), pp. 84-85.
4. Vimolsiddhi Horayangkura, "Integration through Innovation: A paradigm Shift in Architectural Process in Comparative Society," *Journal of Architectural Research and Studies*, Vol. 2 (2004), pp. 87-100.
5. Nigel Cross, *Designerly Ways of Knowing* (Germany: Birkhauser Verlag AG, 2007), pp. 22-23.
6. Sally Augustin and Cindy Coleman, *The Designer's Guide to Doing Research: Applying Knowledge to Inform Design* (US: John Wiley & Sons, 2012), pp. xvi-xvii.
7. Ibid.
8. Nigel Cross, pp. 22-23.
9. Ibid., p. 23.
10. See Frances Downing, *Image Banks: The Purpose, Function, and Meaning of Environmental Imagery for Architectural Designers*, Dissertation (US: UMI, 1989) pp. 3-4.
11. Bryan Lawson, *How Designers Think: The Design Process Demystified*, 4th ed (Hungary: Architectural Press, 2006), p. 46. Also, see Nigel Cross, p. 24.
12. Vinod Goel as noted in Bryan Lawson, *What Designers Know* (China: Architectural Press, 2004), pp. 14-15.
13. Anthony Antonaides, *Poetics of Architecture: Theory of Design* (US: John Wiley & Sons, 1992), pp. 9-11.
14. Bryan Lawson, *How Designers Think: The Design Process Demystified*, pp. 148-50.