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**Jeong Kyeong-Joon, Koo Young-Min**

*84jeongkj@gmail.com*

INHA University, Incheon, South Korea

**A STUDY ON DEVELOPMENT OF SPATIAL COMPOSITION EDUCATION  
PROGRAM  
FOR ARCHITECTURAL BASIC DESIGN EDUCATION  
(BASED ON CHARACTERISTICS OF THE SPACE AND MANEUVERING  
SECTION OF WALL IN MODERN ARCHITECTURE)**

*Abstract.* The purpose of this study is to develop a mediated educational program that can be practically applied in architectural design based on the understanding and systematic analysis of architectural space theory. Based on the changed perspective on spatial composition and the practice of modern architects due to the role of the wall freed from the structure after modern times, this study examines the possibilities of architectural education that students can expand their thinking about space and reinvent intuitive spatial awareness through practice.

*Key words:* Spatial Composition, Education Program, Wall, Space

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## **1. Introduction**

**1.1 Background and Purpose.** Regardless of what the majors may be, it is a separation of theory from practice that has been an obstacle against academic integration.[4,c.i] Architectural education is, in particular, more problematic in the fact that learning and practice cannot be simultaneously achieved in a physical one-to-one relationship. Regarded not only as the fundamental for thinking architecture but also as conceptual entity for construction, space in architecture has been systematically theorized by numerous debates as well as discourses throughout history of architecture.

Having been theoretically established, however, those arguments have not found intermediated educational programs that could be applied in practice. Even if there were any attempts in the existing curriculum on spatial composition, most of them are still in the stage in which vertical vision is drawn from the planar layout. As the walls were to be free from the structural duty since modern architecture, the notion of space has started to present a tendency toward being multi-directional and post-structuralized. The change of the role and meaning of the wall has contributed to the evolution of the approach and thought on space from the planar 'arrangement' of the space to the multidimensional and sectional 'composition' of space. In architectural education,

however, the space composition used to be taught and evaluated in architectural design studio. Even if there has been a specific program for space composition, the evaluation criteria were too ambiguous to have students expand their independent thinking on the space and to cultivate their space perception by intuition through practice.

Against this backdrop, three years of study are underway to bridge the gap between theory and design in architectural education and to establish an educational program by the concept of architectural space that can be applied to design work. Proposed through this intermediate process of the study, a series of programs is as follows: 1) promoting a proper understanding of space composition through vertical thinking of the spaces 2) allowing each student to find a dialog in a space made of learning and intuition through repeated processes of composition and editing 3) establishing a methodology independently, which integrates theory with practice by the evaluation index on spatial composition.

**1.2 Scope and Methods of the Study.** The study is proceeded by the literature review to establish and develop a process for experiments on the construction of architectural space through the results of the first stage of the study, which has examined the characteristics of the architectural space composition since the modern times, and reflected the changed relationship between walls and space.

This study, as an interim process on the development of a curriculum for the construction of architectural spaces for three years, intends to develop an experiment and practice program applicable to education model, to have practical exercise run parallel with lectures on space theory offered by the university's architecture education, and to propose a creative teaching method based on theory and practice.

## 2. Theoretical Investigation

**2.1 Architectural features exhibited by modern architects.** The 20th century's modern architects attempted to change the perception of space by use of walls which had turned a medium of composing architectural space; that is, flowing space, transitional space, and indeterminate ambiguous space.

Such characteristics of space have enabled a production of space based on the spatial sequence and various spatial experiences, which was to be even hardly argued in earlier times. In other words, it has spurred architects to expand the perception of space to an element of representing architecture that involves stories and events. Space's representing the architect's thoughts and ideas after modern architecture, therefore, the process of space composition may seem logical or arbitrary, abstract or exceedingly intellectual.

**1) Frank Lloyd Wright : Exploding the box, expansion of transition space, continuity of space.** Frank Lloyd Wright realizes the concept of transitional space in which the inside of the box extends to the outside while exploding the edges of the box. It is the concept of exploding box that becomes a practical strategy for Wright to inter-penetrate interior and exterior spaces, to maintain the interrelationship of the vertical and the horizontal with continuity and expansion, repetition and opposition.

Wright's concept of transitional space is best exhibited in the Falling Water, in which the morphological transition from vertical walls to horizontal floors turns a

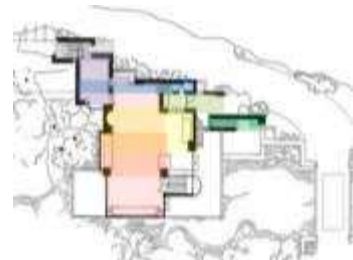


Fig. 1. Falling Water: Overlapped Boxes and

vehicle to tune the transition between narrow and wide, dark and light. Wright also used the wall not as the structural member but an intermediary device to coordinate the space, by which the massing of the cantilevered terraces is maximized and diversely entangled and broken boxes are brought together to be an integrated whole.

**2) Le Corbusier : Movement and change (Plane Libre), outer skin as an abstract plane, phenomenal transparency (overlapping walls, nested spaces).**

Divided into two elements, the structural pillar and the simple non-bearing wall, in Le Corbusier's domino system, the wall expanded its role to an abstracted surface that could be placed freely in space. In the abstract grid space created by the structural grid module, the wall is evolving into a plastic form that causes tension and difference. It is movement and change that makes the prime characteristics of Villa Savoye in the spatial composition. Le Corbusier creates an entire organic order by inserting a continuous flow of space called an architectural promenade in the static structure of the grid[5,c.224].

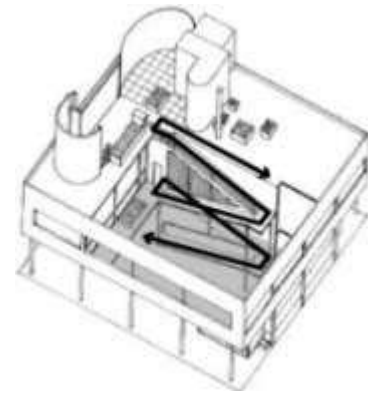


Fig. 2. Architectural Promenade of Villa Savoye

The long horizontal windows of Villa Savoye show that the facade can be located as an independent entity that is, regardless of the interior space, no longer dependent on the space while blurring the boundary between the interior and the exterior space. As such, the wall as the skin of Villa Savoye exists as a two-dimensional abstract surface that implies the meaning of free elevation.

In addition, the view from below the roof of the outdoor pavilion on the second-floor terrace demonstrates spatial transparency through several overlapping space; that is, the pavilion itself and the frame of the external space, the living space directly entering the house. Those are overlapped in the vague juxtaposition of inside and outside with the spatial extension of the horizontal band, the frame of the building and the landscape around the building.

**3) Gerrit Rietvelt & Theo Van Doesburg : Possibility of spatial overlap as the wall expands, flowing space.**

The most important form component of *Destijl* is the wall. Bruno Zevi assumed, "If the walls enclosing the space are independent and can be separated, they can extend vertically and horizontally and transcend the boundaries that block the interior from the outside." This assumption is, in fact, an important clue to understand the open spaces of *Destijl* architects and the flowing space in the interconnection of spaces. Schröder House is the building that best reflects the eleventh point on the dynamic architecture out of the sixteen points of Theo Van Doesburg's formative architecture. This house defines the space as a flowing field, instead of a static room in the traditional sense, through the introduction of time concept allowing the variability of the internal space.

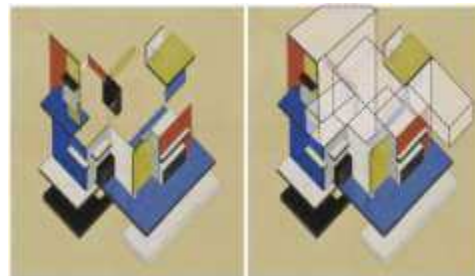


Fig. 3. Possibility of spatial overlap

**4) John Hejduk : Narrative Space, Flatness(architectural space as a transition), Abstracted walls, Accidental discovery, Defamiliarization(express**

**through uncanny).** John Hejduk's drawing allows for spatial perception that is virtually unexperienced in architecture. Hejduk explains the collapse and transference of space by the concept of flatness through an isometric of Diamond House. For him, flatness signifies the moment of latent memory, that is, the moment of present[3,c.259], of which the moment of transition is the threshold as the point of entry and is a starting point of spatial transition.

The distorted perspective displayed in John Hejduk's two dimensional drawing is an act of overturning the conventional system of architectural representation, thereby he created an intentional rift between architecture and its representing drawing[6,c.167]. In the Wall-house 2, the more independent architectural elements and spaces become, the stranger the forms are developed. As such, architectural elements and meaning, the differentiation of functions and the resulting change of hierarchy, have brought architecture the strategy of 'Uncanny'[7, c.62].



Fig. 4. John Hejduk, Wallhouse 2, 1973.

**2.2 Overall: Deriving Design Principles for Space Composition Experiment.**

The study attempted to derive and summarize spatial characteristics according to the function and role of wall in the five modern architects' notions of space as the design principles for the space composition experiment proposed in this study. Details are shown in the following table.

architect	function of wall	spatial characteristics	Design principle	
Frank Lloyd Wright (Falling Water)	segmenting the horizontal	<ul style="list-style-type: none"> <li>exploding the box</li> <li>transitional space</li> <li>space continuity</li> <li>integrated space</li> </ul>	① Spatial Narrative	<ul style="list-style-type: none"> <li>change in cross section</li> <li>variety of movement</li> <li>visual device for continuity</li> </ul>
Le Corbusier (Villa Savoye, Garche)	Formative construction materials	<ul style="list-style-type: none"> <li>proportion and regulating line</li> <li>plane libre</li> <li>skin as an abstract plane</li> <li>phenomenal transparency</li> <li>promenade architecture</li> </ul>	② Rules and Diversity	<ul style="list-style-type: none"> <li>proportional for diversity</li> <li>regulating line : harmony in diversity</li> </ul>
Theo Van Doesburg Gerrit Rietvelt (Schröder House)	Shape component	<ul style="list-style-type: none"> <li>opening and sequence</li> <li>overlapping space</li> <li>flowing Space</li> <li>sectional expansion</li> </ul>	③ asymmetry and balance	<ul style="list-style-type: none"> <li>equilibrium of visual weight</li> </ul>
John Hejduk (Wall House)	chronotopo concept	<ul style="list-style-type: none"> <li>narrative space</li> <li>space as a transition</li> <li>accidental discovery</li> <li>abstracted wall</li> <li>defamiliarization</li> </ul>	④ Dominance through contrast	<ul style="list-style-type: none"> <li>morphological ambiguity through figure and ground</li> </ul>
			⑤ Possibility of Creative Reinterpretation	<ul style="list-style-type: none"> <li>defamiliarization</li> </ul>

Table 1. Deriving Design Principles for Space Composition Experiment

**3. Development of education program for spatial composition experiment**

**3.1 Goal of Space Composition Experiment.** The spatial composition experiment proposed in this study aims to be in line with the design principles derived from the table 1. 1) Spatial narratives to create spatial diversity and continuity 2) Ability to organize shapes that actively utilize walls as design elements 3) Ability to manipulate elevations as walls that imply diverse spaces 4) Ability to compose to express rich spatial depth 5) Ability to construct with balancing different components

**3.2 Experimentation and training details by step.** The spatial composition experiment consists of a total of five steps, and the relevance of modern architects to the spatial characteristics is shown in the table 2 and 3.

spatial composition		process				
		step1 Basic Context	step2 Exploding Box	step3 Spatial Variation	step4 Depth of Space	step5 Architectural Representation
spatial characteristics of modern architects	Frank Lloyd Wright		exploding the box	transitional space space continuity		integrated space
	Le Corbusier	proportion and regulating line	plane libre	phenomenal transparency	skin as an abstract plane	promenade architecture
	Theo Van Doesburg & Gerrit Rietvelt		opening and sequence	flowing Space sectional expansion		overlapping space
	John Hejduk	abstracted wall narrative space	space as a transition	accidental discovery	defamiliarization	

Table 2. Process of Spatial Composition Experiment

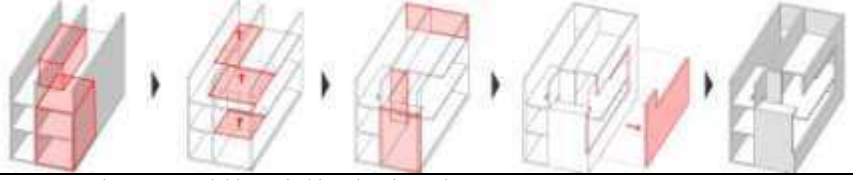
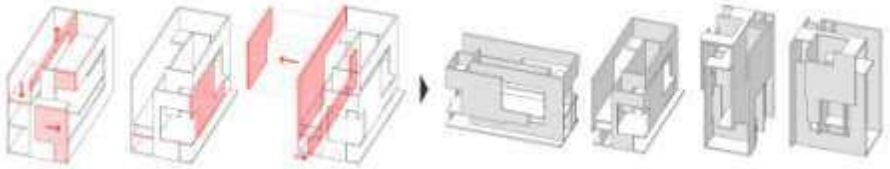
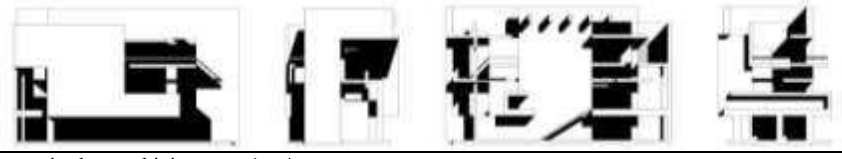

step1 Basic Context	<ul style="list-style-type: none"> <li>Assemble an open cuboid box: 3 layers, 2 spaces divided vertically</li> <li>Excluding certain conditions such as scale and function</li> </ul>
step2 Exploding the Box	<ul style="list-style-type: none"> <li>Properly crushing the given box: the basic framework for the transition of space</li> <li>Properly adjust horizontal and vertical continuous flow</li> <li>Setting the Main and Subspaces &gt; Removal of the horizontal plane &gt; Addition of vertical plane</li> </ul> 
step3 Spatial Variation	<ul style="list-style-type: none"> <li>Reconstruct the step2 model by switching the viewpoint</li> <li>Observe the depth of space caused by overlapping faces</li> <li>Mutual intersection of space: open actively and make continuous construction of wall and floor</li> </ul> 
step4 Depth of two-dimensional Space	<ul style="list-style-type: none"> <li>Remodeling 2D Drawings</li> <li>Imagination and potential for depth inherent in the plane</li> <li>New architectural representation and transition process : enhance cross-sectional thinking</li> </ul> 
step5 Spatial Composition as Architectural Representation	<ul style="list-style-type: none"> <li>Reorganize by combining steps 1 ~ 4</li> <li>Three-dimensional complex thinking that connects cross section from plane to elevation at the same time</li> <li>Reproduce the architecture that contains the spatial characteristics intended by the person</li> <li>Spatial narrative through composition between line, face and solid</li> </ul> 

Table 3. Detail Process of Spatial Composition Experiment

**Conclusion.** This study is an intermediate stage for the development of the educational model for space composition as an architectural design methodology that incorporates theory and practice. The study attempted to educate students how modern architects learned the spatial changes through the medium of wall in practical and systematic ways in the 20th century, and to develop an educational program that recultivate the perception of the space inherent in students' instincts.

In other words, the study aimed at proposing the space composition experiment reflecting the characteristics of the space that has been changed by modern architects, including flowing space, transitional space, and indeterminate ambiguous space, preventing students from producing uniform and standardized architecture by passive and fixed thinking, and developing an original methodology of creating space, time, and light, which is fundamental material for the architect to deal with.

Planned for designing what the performance criteria and assessment criteria should be in the space composition experiment proposed, following study attempts to proceed a practical application in teaching and expert evaluation to verify educational value and consistency.

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Чон Гёнджун, Ку Ян Мин

84jeongkj@gmail.com

Университет ИНХА, Инчхон, Южная Корея

**ИССЛЕДОВАНИЕ ПО РАЗРАБОТКЕ БАЗОВОЙ ОБРАЗОВАТЕЛЬНОЙ  
ПРОГРАММЫ В ОБЛАСТИ ПРОСТРАНСТВЕННОЙ КОМПОЗИЦИИ  
ДЛЯ АРХИТЕКТОРОВ И ДИЗАЙНЕРОВ  
(НА ОСНОВЕ ХАРАКТЕРИСТИК ПРОСТРАНСТВА И  
МАНЕВРЕННЫХ ВОЗМОЖНОСТЕЙ СТЕН В СОВРЕМЕННОЙ  
АРХИТЕКТУРЕ)**

*Абстракт.* Целью данного исследования является разработка опосредованной образовательной программы, которая может быть практически применена в архитектурном дизайне на основе понимания и систематического анализа теории архитектурного пространства. На основании изменившегося взгляда на пространственную композицию и практики современных архитекторов, из-за роли стены, освобожденной от конструкции в настоящее время, в этом исследовании рассматриваются возможности архитектурного образования, благодаря которым учащиеся могут расширить свои представления о пространстве и переосмыслить и расширить интуитивное понимание пространства с помощью практики.

*Ключевые слова:* пространственная композиция, образовательная программа, стена, пространство.

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