Beaux-Arts Composition and Its Evolution in China's Architectural Education

A Case Study of Architectural Education at Nanjing Institute of Technology

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Abstract

As the primary architectural design approach before the Modern Movement, architectural composition maintained its global influence on practice and pedagogy due to the wide influence of Beaux-Arts education. Composition was transplanted into China's architectural education in association with social-political reform in the early 20th century. Changes in the content and principles of composition practice reflected the far-reaching modernization of China's architectural education. Despite criticism of composition as an irrational design strategy, its evolution is inevitably a documentation of the past and a reinterpretation of the present. This paper begins with a literature review of composition and then concentrates on its evolution in China's architectural education, especially in the case of the architecture department of Nanjing Institute of Technology. By analyzing the work of students from Nanjing Institute of Technology, this paper assumes that the context of nationalism accelerated the formation of the characteristics of China's architectural education. Finally, the paper concludes that genius and creativity permeated the entire procedure of modernization, which was doubtless beyond a simple repetition of the Western process.

Keywords: Beaux-Arts education; China's architectural education; composition; modernization

1. Introduction

Composition as the organizing principle of the classical elements was comprehensively applied in functional building design before the 20th century. Thus, it was taken as "the most representative term of the École des Beaux-Arts" (Shan, 2012). In Latin, composittio refers to the Greek word synthesis, which is related to structure or deposition. Alberti introduced the term into the domain of painting during the early Renaissance. The École des Beaux-Arts then made it an equally important term in architectural design. Julien Azais Guadet, a professor at the École, interpreted composition as a general design method in his book Éléments et théorie de l'architecture (1909). According to Guadet, composition first considered practical requirements in plans and then developed elevations and sections based on the existing plans. In the meantime, with aesthetic consideration, the study of classical elements and their principles was the most efficient way to approach the 'correct' composition. (Durand, 1802)

In Beaux-Arts education, analytique, essentially a problem-solving practice, was the basic composition training for freshmen. It was a study in proportion and in the elements of architecture: "the treatment of walls, doorways, windows, cornices, balustrades, porticos, arcades, etc., and usually required the use of a particular one of the so-called 'Five Orders of Architecture'" (Harbeson, 1927). It aimed to set the aesthetic criterion by deliberate consideration of element deposition excluding complicated functional problems. Students were required to solve the analytique problem and to present a monochromatic rendu (rendering) for judgment within 4 to 6 weeks. Students would first make an esquisse (preliminary sketch) independently within 6 hours based on their previous study of classical architecture elements. The initial scheme, called parti, would then be refined based on the individual critique. After finishing the design, the students composed a sheet with drawings of the partial plan and section, particularly the elevation and details of specific elements. The entire last week was usually left for rendering (Egbert, 1980).

In the early architecture atelier, a patron conveyed his experience as solutions of design problems to students one by one, and the students adopted his empirical design approach as their own through repeated practice. Therefore, architectural education had no essential difference from other branches of fine arts, such as painting and sculpture (Gu, 1994). John F. Harbeson, a professor at the University of Pennsylvania (UPenn), regretted the inefficiency at the beginning of his introduction to The Study of Architectural Design with special reference to the

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program of the Beaux-Arts Institute of Design (1927): "I have found that there were many things I had to say over and over again to students before they could finally 'sink in' to his consciousness and become a part of his mental processes" (Harbeson, 1927). With the study of Piranesi's woodcuts, Harbeson presented a set of aesthetic principles of analytique and improper examples (Fig. 1.) to improve the efficiency of architectural education. Composition, which had been a personal and empirical design method, became more reasonable than its sensitive fine-arts equivalents. In addition, as "a general design method to unify all styles," it became comprehensible to not only the elites but also the public. It was translated into teachable knowledge to survive in university education (Weatherhead, 1941).

Fig. 1. Analysis of Analytique by Harbeson in The Study of Architectural Design, 1927

2. Framework and Research Method

In addition to the aesthetics of the classical architectural style, composition concerned enduring rationality. These two characteristics of composition were embodied in its indigenization in China's architectural education at three levels: 1. imitation, in which educators taught by copying the Western paradigm; 2. adaptation, in which educators taught by integrating Western pedagogy with the national culture; and 3. innovation, in which educators created a new educational model beyond the Western one.

To clarify the three levels, this study focuses on architectural education at the architecture department at Nanjing Institute of Technology (NIT) and its predecessor National Central University (NCU). The architecture department of NCU, founded in 1927, was the first collegiate architectural institute in China. In 1952, the School of Technology of NCU, including the architecture department, became an independent institute and took the name NIT. Therefore, NIT in this study generally represents the period from NCU to NIT, which covers from the 1920s to the 1980s (Wang, 2014). Because NIT is one of the most typical Beaux-Arts institutes, changes in its architectural education could reflect the evolution of composition in China.

3. Imitation: From Fine-Arts Pattern to Architecture Composition

As mentioned above, the term composition in the Beaux-Arts model derived from painting. The foreign method was accepted with little cultural resistance due to the preexisting fine arts architectural education established around 1900 in China. By the end of the Qing Dynasty (1636-1912), frequent trade and war with Japan motivated cultural exchange between the two countries. Under the influence of the Japanese Polytechnique, China's architectural education boomed in institutes of technology, which began offering the majors Building and Pattern Drawing. Building stressed utility by teaching engineering techniques, equipment, and construction, whereas Pattern Drawing concentrated on fine arts training, including drawing, painting, and art history. Pattern Drawing subdivided architectural design into practices that related to the elementary idea of composition: forming, deploying, and drawing. When the Beaux-Arts model took command for architectural education in universities in the 1930s, Architectural Design and Theory was still called Architectural Pattern Design and Theory, which implied the integration of French Beaux-Arts and Japanese Polytechnique pedagogies.

In the 1920s, the advanced American Beaux-Arts model served as the catalyst for the establishment of a new architectural discipline in Chinese universities. Graduates from the United States were devoted to institute a nationwide Beaux-Arts curriculum after returning to China. Those who had the best Beaux-Arts program at UPenn, for instance Liang Sicheng (Ssu-Ch'eng Liang, B.Arch., M.Arch. 1927), Yang Tingbao (T'ing-pao Yang, B.Arch. 1924, M.Arch. 1925), and Tong Jun (Chuin Tung, B.Arch., M.Arch. 1928), made especially significant contributions (Strong and Thomas, 1990). Nearly half of the Penn graduates have taught at NCU or NIT. As a result, the aesthetic of Western classism began its transplantation in the Chinese context. Classical styles and principles became persuasive to the public. More essentially, benefitting from the influence of the foreign economy in the early 20th century, China urged the acceptance of the global culture. More and more civic architecture in the Western classical style emerged in Chinese cities after the 1920s.

Following UPenn's program, which placed analytique as the fundamental practice, as seen in John Harbeson's book, the UPenn graduates saw analytique as the most efficient way to build the cognition of architecture for students in China. In the architecture department of NIT, the same training was renamed Western classical composition to distinguish it as foreign. A controversy between cultures arose. The French classical order relied upon Roman archaeology, whereas colonial architecture was used as an example in the United States. However, China had no precedent of Western architecture. Freshmen had more difficulty understanding Western aesthetics and its inherent logic.
than learning drawing and rendering. They carefully followed Western examples through publications of the École des Beaux-Arts (Table 1.), including *Fragments d’Architecture Antique* and *Monuments Antiques*. In addition, publications of students’ drawings at the École provided intuitive examples of *analytique*. First, the students studied the reference books according to teachers’ instruction of classical elements and aesthetic theory. They were then asked to make an *esquisse* and to spend the following weeks on drawing and rendering, as their French peers did. However, they imitated the deployment of elements and treatment of light from the illustrations in the books rather than from personal observation. Obviously, both *analytique* and *Western classical composition* aimed to enhance "sensibility to proportion, feeling for composition, character in drawing, appreciation of ornament, and knowledge of descriptive geometry in projections and in shades and shadows" (Harbeson, 1927), but they were based on different cognition in two different cultural contexts.

Architecture design usually followed the training of *analytique*. After obtaining the knowledge of classical Orders and other architectural elements, including walls, porticos, arcades, doorways, windows, cornices, and balustrades, students were required to study more complex combinations and to design small free-standing structures, such as an entrance to a garden or a loggia in a wall (Figs. 2. and 3.).

**Table 1. Selected Publications of the École des Beaux-Arts**

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<th>Fragments D’Architecture Du Moyen Age Et De La Renaissance</th>
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4. Adaptation: From Western Composition to Chinese Composition

Because the inherent logic of Western construction was rarely uncovered in *Western classical composition*, the training deviated from the intention of the archaeological *analytique*. Moreover, the foreign aesthetic principles lacked cultural roots and convincing logic. Both aspects limited the *Beaux-Arts composition* only to stylistic representation when it was adopted in China. Thus, consciousness of Chinese tradition arose and succeeded in drawing the public’s attention. From the 1930s, several educators dedicated themselves to a survey of Chinese traditional architecture. Before this time, no relevant research was carried out on its category, style, structure, and construction. Meantime, Chinese architectural elements were applied to the *composition* training. A case of *analytique* in the architecture department at Northeastern University (NEU), founded by Liang Sicheng in 1928, reflected the change by depicting a Chinese pavilion in the Beaux-Arts manner (Fig. 4.). *Analytique* in the Western style remained in the training at the same time. (Fig. 5.).

In the early 20th century, the rise of Modern architecture resulted in the fading of classical enthusiasm throughout the world. The Beaux-Arts...
model declined in the United States in the 1930s due to the impact of European immigrant architects (Ockman, 2012). From the 1940s, Chinese teachers and students began to turn their minds to Modern architecture (Figs. 6. and 7.). Heping Hotel (Peace Hotel), a project by Yang Tingbao, who was a UPenn-trained architect and a professor at NIT, was one of the most influential cases of Chinese Modern architecture in the early 1950s (Gu, 2017). With the spirit of the International Style, the building eventually shed itself of Western classicism in terms of its functional form (Figs. 8. and 9.). Zhong Xunzheng, an NIT graduate in 1952, later a contributive architect and an architecture educator, recalled his undergraduate learning:

Though the Western classic composition was mandatory in the first year, I prefer simplified styles in design after that. Teachers are enlightened. They concerned more on the way to solve design problem rather than styles…. (from an interview with Zhong Xunzheng, 2013)

However, Modernism in China was interpreted by the political influence of the Soviet Union in the 1950s. China followed the Soviet pedagogic model and regrouped universities in 1952. The Soviet Union proposed Socialist Realism as a propaganda art style that used native forms to express Socialist political ideology in all allied nations. In China, both the Western classical and Chinese traditional styles became the first to convey the power of socialist governments because they had been used by authorities in Western countries for centuries. Although the restoration of historicism kept Chinese architects from Modernism, it inspired them to continue archeology of traditional architecture in the decades to follow.

Based on Western classical composition, a training named Chinese traditional composition was added in basic design training in the architecture department at NIT. Its students were required to design a free-standing structure such as a pavilion or a monument. Traditional elements including stone lion, bronze ding, e’fang, and queti were selected to frame the scene. In addition, one or two elements in the background were amplified and placed in the front. In addition to architectural elements in different scales, natural plants were also indispensable in the final sheet. Finally, ink rendering was used to interpret volumes and space. In the early stage, Chinese traditional composition emphasized Western aesthetic principles, such as proportion, scale, and symmetry. Found in the work of Zhao Fuxing (Fig. 10.), all elements were unified by the upper arch, which was a Chinese structure but similar to the Roman one. Compared to the analytique example in Harbeson's book (Fig. 11.), the Corinthian Order at the left was replaced by a stone lion, with both in light-color stone, and a dark bronze ding took the low right corner instead of the iron vessel. A similar contradiction was shown in the work of Zhuang Youji (Fig. 12.).

The construction logic uncovered by the survey on Chinese traditional architecture was for the first time used to compose Chinese elements in Part of a Xieshan Roof (Gable and Hip Roof) (Fig. 13.). Gao Mingquan, one of the teachers who conceived the training in 1954, recalled:

Students and teachers from the architecture department had taken surveys of the Forbidden City in Beijing. So design of the training was completely based on their survey drawings. It represented the true proportion, size, position and conjunction of Chinese architectural elements. (from an interview with Gao Mingquan, 2013)
Unlike Western classical composition that stressed volumes, the monochrome rendering in the Chinese case was used to articulate form and structure, especially the richness of materials. In fact, endeavor had been made on the expression of actual materials before Part of a Xieshan Roof. The work of Liu Xianjue in 1953 (Fig.14.) concerned more precise measurement of architectural elements, from columns to motifs. Chinese painting pigment was used to express the specific material of each element. Most were colored in a plain brush except for the columns in rendering. Obviously, the Beaux-Arts skill was more appropriate to show these solid volumes.

Fig.14. Liu Xianjue, A Decorative Hall, NIT, 1953
Fig.15. Anonymous, The Yangtze River Bridge Tower, NIT, 1982

Nationalism doubtless accelerated the indigenization of composition training in China. In contrast, the Beaux-Arts pictorial aesthetics, strongly criticized by modernists, restricted most training to style. Although the preliminary concept of Part of a Xieshan Roof involved tectonic thinking, it can be assumed that students spent so much time finishing their rendering that they might have missed the chance to consider the construction logic due to the limited class time in the Soviet teaching model. Some steps in the analytique, including reference book review and even esquisse, were skipped. As a result, this simplified teaching process led to a division between design and representation.

Although the closure of the École des Beaux-Arts nominally ended the long-lasting educational model in 1968, its fine-arts influence remained until the mid-1980s in China. In the first 3 years after the Cultural Revolution (1966-1976), classical and traditional architectural elements were replaced in composition training. For example, the Nanjing Yangtze River Bridge Tower (Fig.15.; designed in 1960 and completed in 1969), an exemplar of the Modern architectural projects designed independently by Chinese architects, was introduced in the first-year practice at NIT. The undecorated form after scraping off the classical details articulated structural order, spatial organization, and rich materials. It is obvious that the Beaux-Arts principles, such as symmetry, balance, and rhythm, still dominated the frame of the work. The shadow of the horizontal reinforced concrete roof slab cast on the vertical columns and the wall behind indicated the depth of space with the use of classical disciplines, and the work was also a monochromatic rendering.

In advanced design training, a further exploration of Chinese culture was reflected in the deduction of architectural character, which is a Beaux-Arts term closely related to composition. "The word Character means many things: the question of style, or period...of the size and scale of the building being designed, of the materials of which it is made, and, most important of all, of the uses to which it is to be put—commemorative or utilitarian, domestic or public, religious or secular, etc..." (Harbeson, 1927). Colin Rowe even claimed that "a truly significant building is preeminently a structure, organized according to the principle of architectural composition and infused with a symbolic content which is usually described as character" (Rowe, 1976).

Therefore, character refers not only to a comprehensive solution to design problems, but also to an emotional and spiritual expression of architecture more than a visual art. By expressing architectural character in proper forms and functional layouts, Chinese architects managed to define architecture in Nationalism. For instance, teahouse design, a project at NIT beginning in the late 1940s, required a basic understanding of Chinese culture. The character of a teahouse was found in vernacular dwellings that evoked a response to the natural environment and everyday life (Figs.16. and 17.).

Fig.16. Anonymous, A Teahouse, NIT, 1950s
Fig.17. Zhang Hong, A Teahouse, NIT. 1980s

5. Innovation: From Composition to Zuhe

The transformation in composition training reflected a change in attitude towards the Beaux-Arts model and Western culture. Responding to the demands of ages, the essential aim of architectural education gradually moved away from aesthetic issues to other design problems.

Diversification of design problems raised two crucial issues beyond aesthetics—technology and space. In the 1950s, these three issues were roughly included in composition, so the definition of composition became much broader than ever. As one of the designated reference books for Chinese students, Introduction to Architectural Composition, edited by the Soviet Academy of Architectural Science, noted that architectural composition was not only for art, but also for the requirements of function and economy. The book proposed a term Spatial Volume Composition focusing on the dialogue between external and internal space in addition to facade regularity.
Although stylistic treatment gave its dominant place to utility structure and construction, the book still taught classical aesthetic principles. Therefore, Spatial Volume Composition could be regarded as a compromise between Modernism and Classicism or as an unsuccessful attempt at modernization in some sense.

Alongside the pervading concept of space in China in the 1980s, composition was gradually replaced with a new term—Zuhe—in terms of the organization of space. Zuhe proposed a universal design procedure for architecture in all types and styles. As a result, the term composition returned to the original fine arts meaning.

In the meantime, ways to get freshmen to start a design was first discussed in the architecture department at NIT. With internal motivation and exotic influence, rational creativity intended to completely replace the Beaux-Arts imitation and made design a teachable technique. Composition practice remained a representation training of rendering, whereas problem-based design took Zuhe as a solution to issues such as function vs. space, material vs. construction, and site vs. environment. The final work could simply be an organization of abstract geometric elements with no obsession about sophisticated visualized aesthetics (Fig.18.).

Therefore, in China's architectural education, the evolution of composition reflects the interaction between national tradition and foreign infusion. In the case of NIT, the vitality of composition inspired educators to establish an independent educational system beyond the Western model. Although the core of the Beaux-Arts had been distracted in some sense, and some experiments were less than successful, the reassessment of the Beaux-Arts composition was still valuable for studies on the modernization of China's architectural education. A broad sense of design that defines composition as a knowledge system led a promising way to Chinese Modernity.

6. Conclusions

As the most essential training of the Beaux-Arts architectural education, composition was always associated with classic styles and was considered to be a completely empirical pedagogy. Its rational theories were ignored when style-oriented design declined. The degradation of the Beaux-Arts education led to its gradual replacement by Modern design approaches. However, as a category of design methods, its logic and rationality remained significant influences on the transformation from classical to Modern architecture.

Based on archaeology of classical antiques, composition initiates from fragments rather than from the entity. Nathaniel Cortlandt Curtis presented a more persuasive explanation of composition from two aspects—elements and primary rules—in his writing Architectural Composition. "It is the harmonious combining of elements, then according to the laws of arts" (Curtis, 1926). Moreover, changeable elements and principles allow composition to be a transformative design method that can be integrated within various cultural contexts and within modern thinking.

References