A Case Study of Open Architecture Concept on Urban Renewal Design in Harbin

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ABSTRACT:
Several typical courtyards in downtown Harbin were selected as the case for students. The idea of open architecture was introduced in to the teaching process with two steps of site investigation and the renewal design, aiming to enable the students to understand and apply this design idea. It is important for future architects to incorporate the sustainable development concept and the open architecture idea in their designs. Through the design process, the authors tried to introduce a newly, facing the practice and the open style educational model into the students' teaching system.

At the beginning, the students studied the original behaviors in service, buildings' historical situation and function, and the viewpoints of native residents, outside tourists, and other interested parties. This area in Harbin is well preserved with fine scales and deep cultural connotations. It is a traditional pedestrian street with commercial establishments on both sides. The study area contains street spaces and courtyard spaces which were surrounded by roadside buildings. Due to the overexploitation of local establishments, the original street space facilities can no longer meet the present functional needs. Facing with the protections of the historical culture blocks, the call of the development and the renewal are becoming stronger.

After careful analysis, the students proposed renewal plans based on existing structural systems. The process gave students an opportunity to understand the open architecture concept. Ultimately, the idea of open architecture can enhance architectural teaching and the creative process, manifest the construction’s variability and the sustainability.

Professors of the senior class proposed to combine the theory of “open architecture education” with “open architecture” and established a new mechanism of design course teaching. Design of open architecture not only depends on solving spatial relationship, function and structural organization, but also needs to embody open, free and cultural “place spirit.” This architectural theory can cultivate a new thinking mode among students and improve their creativities and pioneering spirits.

Keywords: Open Architecture, Teaching Practice, Field Investigation, Urban Renewal.

1 SUBJECT SETTING

Design Subject: District Courtyard Renewal and Transformation Design of Harbin Zhongyang Street.

Teaching Task

The intersections between the main street and auxiliary streets of the Zhongyang Street area form a multi-level public space system, and main street—auxiliary streets—courtyards—families constituted hierarchical and the traditional courtyard space. However, it had become more and more difficult for these traditional courtyards to satisfy the requirements of
modern life with the passage of time. The original residential function, disruption of these houses, aging of building structures and lack of facilities no longer meet these requirements. Based on above thoughts, the professors planned to provide a design course involving selecting spaces and redesigning spaces in the Zhongyang Street area a unique urban resource of Harbin. The buildings were mostly commissioned and designed by Russian immigrants in the 1920s.

Teaching Purpose
Starting from “field”, “function”, “space” and other problems of the courtyards, this course was designed to enable the students to discover, study and solve problems, expand cognition for open architecture conception and deepen the knowledge for rational methods of architectural design via renewing the courtyard buildings.

Design Content
The subject the spatial scope of three streets and two adjacent housing blocks has been selected as the site for open building design. Our professors investigated the study area before selecting the subject courtyards and found 3 to 4 courtyards from which students themselves can select 1–2 courtyards and propose modification plans. The overall design requirements were to replace the residence function of the original courtyards and create open multi-functional spaces that may be used for leisure, entertainment, commerce and so on. The continuity of modified courtyard spaces as well as smooth traffic flow can be ensured. By creating breezeways at the ground level of the buildings, the traditional courtyards can become a continuous district. Pedestrians will be able to access the modified courtyards of every housing block and the courtyards are expected to be revitalized.
2 Teaching Procedures

Recollection of Courtyards——Research on Existing Condition

Field investigation was introduced into the architectural design course. We first provided a topographic map representing streets and existing building layout to give the students a general idea before field investigations. Based on the topography map, we explained the development status of commerce, tourism, culture, sanitation and other kinds of facilities in the district. We also gave investigation guides to students by further combining analysis on urban texture, historical context, block function, street space, courtyard space and other concerned status and factors.

Students carried out field investigation of courtyard spaces. With 3–5 persons as a working group, the students randomly selected 1 or 2 courtyards out of 4. They went through the social scenes of the modern courtyard spaces and illustrated findings in hand drawings, photos, cartography and other writings. Students will find problems and record their investigations, which should be taken as design basis for modification.

Common conclusions for courtyard status were drawn: The courtyards adopted the pattern of “upper-floor housing/ground floor shops” as well as “street facade and backyard” arrangement. There were public tap water faucet, sewage pool, public toilet in each courtyard, which became the semi-public and semi-private space for social and outdoor activities of residents; the building space arrangement was not confined to a fixed format, and exhibiting high flexibility; the house structure and municipal facilities in courtyards were damaged seriously due to natural aging; mottled building façade indicated that many houses had exceeded service life and became old and unsafe. Being short of necessary sewage discharge facilities and winter heating facilities, the living quality was very poor; due to historical reasons, the phenomenon of serious illegal add-ons. Most of these illegal structures were wood structures which were fire hazards.

Figure 3-6 Courtyards A, B, C, D

Although these courtyards had similar problems, each courtyard had its uniqueness.

Courtyard A: Transition junction of facades and key decoration composed of cornice, mutual and parapet.

Courtyard B: Most buildings are not connected at the façade turning points and the openings created allowed a imaginary extension of the courtyard.

Courtyard C: The courtyard’s scale was very comfortable and had room for exertion.

Courtyard D: Courtyard space was not as irregular as the others, and the function replacement was comparatively easy.

Summary of investigation results: Each group had put forward unique thoughts for their courtyard modification; moreover, students in each group had different cognition and different explanation for the same issue. In view of open building education, such results accorded with cognitive law. During this process, teachers guided the students and discussed problem solving methods with them.

Continuity of Courtyard——Creative Design Scheme

This stage was to study design methods of open architecture. In order to help students to collect subject information, We had planned several class lectures joined by several experienced architects to introduce their practices to students. These academic lectures are more like a design firm discussion than a formal lecture. We hope the “open” discussion would also help their understanding of “open” concept in all aspects of life.
During this stage, students had their own idea for design from all aspects. The following are the suggestions put forward by students for the courtyard renewal.

**Courtyard A:**
- Roof: Remove debris on roof, repair cornices and dormers on the roof and add cornice design.
- Door and Window Openings: Repair door and window frames and add European-type architrave, replace broken glasses and repair door openings.
- Wall: Clear advertisements on wall, repaint according to colour theme.
- Outdoor Stair: Add one stair.

**Courtyard B:**
- Roof: Remove debris on roof, set European-type for cornice, and parapet.
- Door and Window Openings: Based on existing openings, add European-type architrave to the windows and doors. Create breezeways with the same architectural style.
- Wall: remove advertisements on walls, repaint according to colour theme, treat walls with the same architectural details.

**Courtyard C:**
- Roof: Remove debris on roof, repair cornices and dormer on the roof and add cornice design.
- Door and Window Opening: Repair door and window frames and add European-type architrave, replace broken glasses and repair door openings.
- Balcony: Add joint railings for the second floor balcony.
- Wall: Repaint according to color theme, demolish wood-structure add-ons and restore brick walls.
- Outdoor Stair: Repair outside stair and add one stair.

**Courtyard D:**
- Roof: Remove debris on roof, set European-type for cornice, and parapet.
- Door and Window Opening: Re-paint frames of doors and windows, replace broken glasses and repair door openings.
- Balcony: Remove debris on balcony, repair underside of the balcony as well as railing Repaint.
- Wall: Clear advertisements on walls, repaint according to colour theme. Treat walls with the same architectural style.

**Renewal of Courtyard——Scheme Design**

Students had proposed modification design for courtyard space after field investigation and scheme conceiving. The following are the design schemes for the four courtyards.

**Courtyard A:** Part of original building façade should be preserved, repaired or modified. Indoor and outdoor space openings can be realized with covered courtyard. Outdoor stairs, breezeways and other components can be preserved without changing original appearance, structural system and basic plane layout to promote circulation and communication of pedestrians within the courtyard and between courtyards.

**Courtyard B:** Illegal buildings should be removed first to rescue the courtyard from a shabby state and restore the courtyard to its original space temperament and texture; the courtyard design should maintain the original spatial form, temperament and historic features; and emphasize on cultural characteristics of this courtyard.

**Courtyard C:** This scheme aimed at the modification design of functionality decline due to structure decline of this traditional courtyard to form new strategy of stimulating courtyard functionality regeneration. The courtyard originally was residential space, with comparatively single function. Additional usages like leisure, restaurant, pub, characteristic hotel, historic expo and so on which are relatively quiet in nature can be introduced into this courtyard.

**Courtyard D:** It was considered unfavourable for extroversive and close spatial form in the traditional courtyard to organize commercial people flow and difficult to form scale effect, the emphasis of courtyard renewal and transformation should be placed on remodelling structural relationship of courtyard space to lead commercial people flow on pedestrian street into this courtyard and provide a variety of commercial services and comfort.
CONCLUSION

To summarize this reform attempt of design course teaching, the evaluation on the course effectiveness was based on:

The teaching mechanism emphasized on combining open architecture education with open architecture. Through the design modification of typical open spaces of courtyard, the students mastered a new design technique and design concept after completing enlightenment stage of architectural education.

From uncertainty to certainty, the open design theme and the research process played an important role in cultivating students’ capability to connect with society, finding problems, analyzing and solving the problems. Students have gained more sense of rationality and responsibility. Their individuality, imagination and creativity were fully reflected in the process. Through field investigation, the students gained first hand
knowledge of buildings, spaces and functions. Through secondary research, they had a better understanding of the architecture major. The designing process further enhanced their appreciation of the profession.

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